

Settlers' Guide

for the
Settler



The Canadian Pacific Railway
Colonization Department
Montreal, Quebec, Canada

SETTLERS' GUIDE

A Handbook of Information
for Settlers in the
Canadian Pacific Railway
Irrigation Block



THE CANADIAN
PACIFIC RAILWAY COLONIZATION DEPARTMENT
CALGARY, ALBERTA, CANADA
1911

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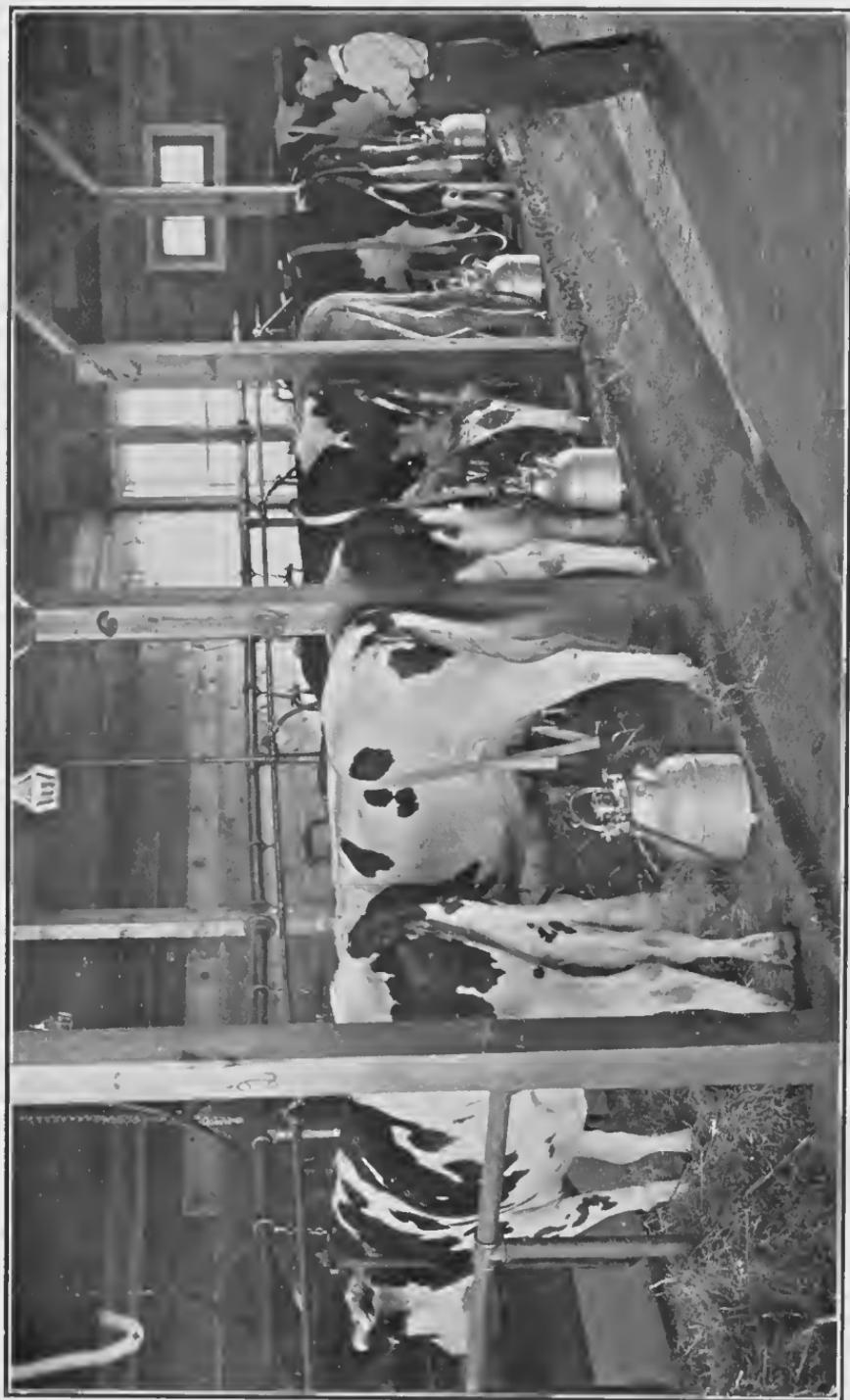
This booklet is intended solely for the use of those who have purchased lands within the Canadian Pacific Railway Company's Irrigation Block with the intention of making their homes there. As a rule when a corporation has sold a farm to a new settler, its interest in the transaction immediately ceases except in so far as deferred payments are concerned. The Canadian Pacific Railway Company being essentially neither a "water selling" nor a "land selling" concern is, however, in an entirely different position. With the sale of the land, the Company's real interest in the land practically only commences. This Company sells its lands at a low figure and supplies water for irrigation at the barest cost. It is not, by any means, actuated by philanthropic motives in so doing. The Company has undertaken the colonization and development of the Three Million Acre Irrigation Block almost solely with the view of creating the greatest possible amount of railway traffic on this area, which, as is a well known fact, is invariably the result of colonization on irrigated land.

The Company's handbook dealing with the Irrigation Block, bears on the front page the following sentence:—

"The future home of the most closely settled and prosperous mixed farming, stock raising, and dairying community in Western Canada."

Unless these conditions are actually brought about, the Company's aim will not be fulfilled. The mere sale of the land is only a means to the end—the successful settler is the end the Company strives to attain.

The object of this booklet is to extend to new settlers, unacquainted with our institutions and our climatic and soil conditions, a few hints which, if followed, may probably save them considerable disappointment, and may be the means of leading them into successful farming earlier than would otherwise be the case.



Milking Machine in operation at Strathmore, Alberta, C.P.R. Demonstration Farm.

PART I.

USEFUL INFORMATION FOR SETTLERS

PUBLIC WORSHIP.

The utmost religious liberty prevails in Canada. There is no State church. Christian churches of various beliefs are found in the country towns as well as in the cities. The number of specified denominations of religious thought in the Dominion, according to the census of 1900, was 142. No place is the Sabbath more respected than in the Canadian West.

SCHOOL SYSTEM.

The Public School system established in the Province of Alberta is well abreast of the times. Its management is vested in one of the Ministers of the Government. The organization of school districts is optional with the settlers. Districts formed cannot exceed five miles in length or breadth, and must contain at least four actual residents and eight children between the ages of five and sixteen.

The cost of maintaining schools is small, owing to the liberal assistance given by the Government; the public grants paid yearly to each school are from \$250.00 to \$300.00 per year. Each teacher employed must have a certificate of a recognized standard of education, and a thorough system of inspection is inaugurated, each school being visited twice during the year. In the schools of the larger towns, the higher branches of study are taught and pupils prepared for university matriculation and teachers' certificates.

The law also contains the following provision authorizing the organization of school districts by the Minister of Education in cases where it is considered desirable to do so without any petition from the settlers:—

“In case any portion of the Province not exceeding five miles in length and breadth exclusive of road allowances has not been erected into a school district, the Minister may order the erection of such portion into a District provided that it contains:

- (a) Twenty children between the ages of five and sixteen inclusive.
- (b) Ten persons actually residing therein who on the erection of the district would be liable to assessment.
- (c) Six thousand acres of assessable land; and notice of the erection of any such district shall be published in the official gazette, which notice shall be conclusive evidence that the district has been duly erected and constituted in accordance with the provisions of this ordinance.”

Settlers wishing to form a school district should communicate with “The Minister of Education, Edmonton, Alta.”

TAXATION.

The rural taxation system of Southern Alberta is based entirely on the land. Improvements, live stock, chattels or personal property of any kind is exempt absolutely. The Province pays a large share of the cost of education and public works, and as it derives its principal revenue from the Federal Government by annual per capita grant, it is unnecessary to levy any considerable local taxes.

As soon as the Canadian Pacific Railway disposes of a parcel of land, the same becomes liable for Local Improvement and General Provincial Education taxes, which, when levied by the Government, will not exceed a total of $2\frac{1}{2}$ cents an acre. If, however, the district in which this land is situated is erected a School District or Local Improvement District, or both, a tax may be levied up to a rate of 15 cents per acre. The maximum tax that may be levied under the Educational Tax act being 10 cents per acre, and under the Local Improvement act, 5 cents per acre, thus making the total of 15 cents per acre. These rates are, of course, subject to be changed by the Provincial Government should it be found advisable.

Those purchasing land from the Company who do not receive within a year from time of purchase, the usual tax notices, should apply to "The Department of Public Works, Edmonton, Alberta," when full information will be sent them.

SYSTEM OF LAND SURVEY AND ROAD ALLOWANCES.

The lands in the Irrigation Block are laid off in townships, practically square in form, bounded on the east and west sides by true meridians of longitude and on the north and south by chords of the circular parallels of latitude. The tiers of townships are numbered from one upwards, commencing at the International Boundary, and lie in ranges from east to west, numbered in regular order westward from certain standard lines called "principal meridians." Each township is sub-divided into 36 sections, each containing 640 acres, more or less. Each section is in turn divided into four quarter-sections of 160 acres each, which are designated the South-East, the South-West, the North-East and the North-West quarters. Each quarter section contains four legal sub-divisions of 40 acres each. The corners of each section and the intersection of quarter-section lines with section boundaries, are marked on the ground by suitable posts and mounds, rendering it an easy matter to locate any particular piece of land.

Road allowances are provided running North and South between each section, and East and West along the Northerly boundary of every second tier of sections, commencing from the Southerly boundary of the township.

The accompanying diagram will show the manner in which townships are laid out, and also the position of legal sub-divisions in a section.

FENCING.

Great care should be exercised before fences are erected to see to it that the proper corner stakes are correctly located with reference to the centre of

the section. This may save changing long lines of fence construction. Although the accompanying diagram sets out the location of the various monuments very plainly, many costly errors have been made by not carefully observing these posts or monuments, and where any doubt exists, application should be made to the Company to have the proper boundaries established.

The Company is prepared to fence its main, secondary and large distributary canals at such a time as land owners erect their fences to connect with the same.

CUSTOMS REGULATIONS.

The settler is allowed to bring in duty free, wearing apparel, also household goods and farm machinery that has been in use for at least six months, but this does not include threshing machines or engines of any kind. On threshing machines, including engines and separators, a duty of 20 per cent. on their valuation is collected; on automobiles, 35 per cent.; engines, alone, 27½ per cent., and engines for farming operations, 20 per cent. The land buyer may bring in duty free, one head of horses or cattle for each ten acres of land purchased or otherwise secured up to 160 acres, and one head of sheep for each acre of such land. Other stock may be admitted up to any number, on a payment of 25 per cent. on valuation at the point of entry. However, any number of registered stock may be brought in duty free, provided certificates of such registration, in Canadian Herd Books, are shown to the proper Customs Officials. It may be well to take special note that it does not pay to smuggle anything in that is dutiable, otherwise such goods or chattels may be confiscated, or if not, an amount may be assessed against such articles that would make it quite equivalent to confiscation. The owner or a competent attendant should accompany the shipment to the point of entry, in order to pay the proper duty charges, unless a suitable certificate is secured before starting. Goods of every nature may be forwarded in bond, to any point of delivery, which must be in that case a port of entry. Otherwise, such shipment will be sent to Calgary, or to some other port of entry, and back freight will be charged. Very great inconvenience may be saved with reference to the matter of duty by obtaining full information before making such shipment.

AGRICULTURAL DEVELOPMENT.

The Company's main object in entering into irrigation development, was to materially increase traffic. It is, however, realized that the majority of the people who purchase irrigable lands will be, more or less, ignorant of irrigation farming practices. Under the circumstances, the Company has thought it well to go a step further and to promote the dissemination of valuable agricultural information among the farmers, bearing upon the theory and practices of irrigation and the production of the special crops

C.P.R. Demonstration Farm, Strathmore, Alberta.



that have made irrigation farming so profitable all over the American Continent. In taking such action, the Company does not claim to be actuated by any philanthropic motives. While this policy cannot fail to be of the greatest advantage to the farmers, the Company hopes to benefit materially from the traffic incidental to the general adoption of better and more practical farming methods.

With these objects in view, an Agricultural Branch has now been created under the Irrigation Department, in charge of experts with years of experience in practical irrigation farming and with thorough scientific agricultural training. This branch has devoted special study to the more important agricultural problems presenting themselves and is equipped to give the best information and advice on all matters pertaining to the development of the irrigated farm. Farmers on the Irrigation Block are earnestly invited to utilize the services of the Company's staff to the greatest possible extent. Communications will be promptly attended to and should be addressed to "The Superintendent of Agriculture, C. P. R. Demonstration Farm, Strathmore, Alberta."

Another important educational institution maintained by the Company is the Demonstration Farm at Strathmore. This farm contains 1000 acres of irrigated land and is equipped with one of the largest dairy and swine herds in Alberta under thoroughly competent management. An extensive poultry plant also forms part of this institution. The object of this farm is three-fold:—

- (1) To conduct agricultural investigation and demonstration in order to ascertain the most profitable varieties of cereals, fodder plants, trees, etc., for the Irrigation Block.
- (2) To place at the service of the farmers there at low cost the use of pure-bred sires of the best breeds and to distribute by sale, male and female stock of the highest merits and best suited for local conditions.
- (3) To develop suitable strains of pure seed, to grow the same in field plots and to disseminate the best varieties of pure seed amongst the farmers.

It is the Company's desire that water consumers in the Irrigation Block should take the fullest possible advantage of the privileges available in connection with the Company's Demonstration Farm.

Another of the Company's activities in an educational way, is the publication of the "Settler's Guide," and timely bulletins dealing with matters of interest to farmers in the Irrigation Block. These are mailed free of charge and may be obtained by addressing "The Superintendent of Irrigation, C. P. R., Calgary."

AGRICULTURAL SCHOOLS.

From time to time at different towns in the Irrigation Block, Agricultural Schools are held which are of immense benefit to the settlers, and which are free to all who attend.

These schools generally last one week at a place, and consist of practical work in stock, grain and weed seed judging, and also of lectures upon every phase of soil and crop handling. Several cars of the best stock in the Province are brought for the lectures and practical judging work; and the best lecturers obtainable are secured for the various agricultural subjects discussed.

Sessions begin at 10 o'clock a.m. and continue until 4 or 5 o'clock p.m., with an intermission for lunch. The judging of stock, grain and weed seeds is first explained by experts, then the farmers are asked to pass their judgment on the various samples, or stock exhibited, and thus the practical lessons are taught.

Some idea may be gained as to the popularity of these schools when we say that, in one week during February, 1911, over 2400 farmers attended an Agricultural School held on the Canadian Pacific Railway Demonstration Farm. This school was the result of co-operative interest between the Department of Agriculture of the Province of Alberta, and the Canadian Pacific Railway Demonstration Farm. Those in charge declared it to be the best, both in point of attendance and in enthusiastic interest that has ever been held in Alberta.

By such means as the Demonstration Farm, and the co-operative Schools of Agriculture, the Canadian Pacific Railway purposes to bring the best agricultural information and advice to the settlers of the Irrigation Block.



PART II.

THE FARMSTEAD

The term "home" as applied to the farm, stands for more than a mere house to live in and shelter for the live stock. It embraces everything that enters into the comfort, enjoyment and satisfaction incidental to farm life. No reason exists why the farmer may not enjoy practically all the comforts and conveniences that are available in cities. It is all a question of capital and labour. It goes without saying, that the prudent farmer starting in a new country with limited capital, will provide only absolute necessities to begin with. He should, however, foresee the day when he is able to provide for himself and family surroundings and accommodation in keeping with his prosperity. There are any number of farm homes in Western Canada to-day, situated on the naturally treeless plains and miles removed from centres of population, which are fitted with all modern sanitary conveniences, lighted with gas and offering the same comforts and conveniences usually found in high class city residences. Such a home will easily be within the reach of every hard-working and level-headed farmer who possesses sufficient capital to make a fair start in the Irrigation Block.

However important the business side of the farm may appear, it is not more important than the creation of an attractive and comfortable home, surrounded by tasteful grounds and garden and sheltered by beautiful trees and shrubs. In other words, a home where the boys and girls will be satisfied to remain. The besetting sin of the average colonist is his disregard for surroundings. Every settler should make up his mind to create not alone a prosperous farming business, but also a tasteful and comfortable home. His common sense will indicate the time when he can afford to invest a part of his capital in the latter.

It is an absolutely safe statement that 75% of settlers commit serious mistakes at the very beginning in laying out their buildings. Everyone should have a crude picture in his mind's eye of the home and surroundings he will ultimately create for himself. He should then erect his initial buildings with a view to the ultimate completion of his plan. No matter how trivial any permanent improvement may be, it should be so placed and so constructed that it may ultimately form part of a well considered whole. The shack may be designed to serve as granary or workshop at a later period. If so, it should be located where this building will be most convenient and least conspicuous. As years pass by buildings will be added. The site of each should be carefully considered. It takes money to move and re-arrange existing buildings. The placing of the first house and stable at the most convenient place that suggests itself, without any regard to future requirements, can only result in an unsightly and inconvenient

arrangement of the homestead of which the owner will always be conscious and which will require considerable outlay to change.

It is not the intention to encourage settlers with small capital to make immediate and large investment in buildings that are not essential to successful farming during the early stages. Such would be folly. It is also realized that for a few years the ordinary work of the farm will perhaps not admit of any large scheme of tree planting and ornamental gardening. The wise colonist will, however, realize the economy incidental to working towards a well-considered arrangement of buildings and will not overlook the importance attached to attractive and tasteful home surroundings and the purpose of the succeeding pages is to give a few hints on the subject in order that expensive mistakes may be avoided and systematic effort take the place of haphazard methods in laying the foundation for the future home.

The beautiful home surroundings have much more than simply an aesthetic value. They add very materially to the commercial value of any property. Indeed in hundreds of cases, the appearance of the house, yards and buildings has been the factor that has decided the case for the purchaser in comparing one farm with another. It costs considerable in time and labour to produce a beautiful home, but both time and labour are amply repaid in dollars and cents, as well as in personal satisfaction and home comfort.

GENERAL ARRANGEMENT OF BUILDINGS.

Decide on what shall be the general shape of the buildings, both as to style of finish and general architecture. It detracts very much from the appearance of the home surroundings to see one building with a hip roof, another with an ordinary one-third pitch, and so forth. Of course buildings will vary in size, but have the general architectural effect the same as far as possible.

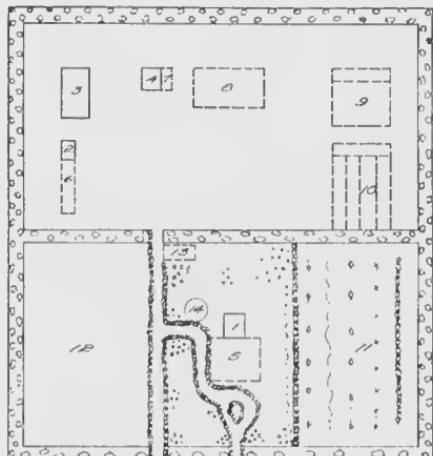
Another very important point in the erection of the buildings is to so construct each building, and so place it in the scheme of buildings, that it may be added to at any time without upsetting the general plan, or without overcrowding in any sense.

The general construction of the dwelling-house is important. The front, or living rooms should, if possible, face the south. On the east and west, and particularly on the south, plenty of windows should be provided, so that the almost continued Alberta sunshine will benefit these rooms from earliest morning until late at night.

Another very important point in the arrangement of farm buildings is with reference to convenience in handling the work. Locate as conveniently near one point as possible all buildings that have especial reference to the horses and their work. The horse barn, implement shed and granary should be close together. The granary also should have reference to the cow or stock barn. As the hog barn requires, proportionately, much less grain, bedding, etc., than either the cow or horse barn therefore place it further away from the granary and horses, and yet it should be placed in such a position as to fit perfectly into the scheme of buildings.

The poultry buildings and runs should be placed somewhat convenient to the dwelling-house, as it is altogether probable that the women will give attention to this branch. The well should be convenient to the house and also to the dairy and barns. From the dairy house, the water may run into troughs situated at the corner of the horse and cattle yards. Provision should be made for a small circular drive in front of the house which might also connect with the main drive way. This road might pass close to the house for convenience in unloading coal into the cellar. The farm entrance should lead directly to the horse and cattle yards, where the most traffic with wagons and implements will be.

Thus in laying out plans for a real farm home let common sense and



1. First small house.
2. First part of driving shed.
3. Horse barn used as general
stock barn at start
4. Granary.

Buildings erected
first year.

5. House built later.
6. Extension of driving
shed.
7. Power & crushing house.
8. Cow barn.

9. Hog barn.
10. Poultry house & yards.
11. Fruit Garden.
12. Vegetable garden.
13. Dairy house.
14. Well.

convenience be a large guiding factor. We should keep clearly in mind, not the home as we may be able to build it to-day, but rather the home as we expect it to be after some years of development.

THE FIRST HOME.

The above plan shows six acres as occupied by the settler when the first house, barn and possibly small granary and implement shed are erected. The

dotted lines, hedgerows and fruit garden, will show the idea that the farmer has in mind as the final arrangement of his buildings and yards, and represents the home as it is to be.

At first glance, it may be objected that too much land has been reserved for building site. Every foot of this ground, not required for yards, or house enclosure, may, however, be very profitably utilized for garden, strawberries and small fruits, pasture for young stock, etc. At the same time the foundations are laid broad and deep for an extensive farm business, which it should be every farmer's ambition to create. The plan also provides ample room for a beautiful home, with attractive and tasteful surroundings.

FIVE YEARS AFTER.

In the Irrigation Block farmers will generally go in for mixed farming, with dairy cows and hogs as a special line. For the first year or two the one barn will probably have to house the horses, cows, hogs and poultry. But year by year, as time and means permit, other buildings will be added until at the end of five or six years the six acre enclosure begins to look somewhat like our suggested building plan.

By this time the shelter belt has grown to from ten to fifteen feet in height, new roads and drives fringed with such hardy hedge material as Caragana, Willows, or even White Spruce have been added round the house. Clumps of various shrubbery have been scattered about the lawn, a neat little dairy house has been tucked in the shade and shelter of the trees and shrubs convenient to the well, and beautiful flower beds add to the effect.

Many farmers to-day would give thousands of dollars if they had within their power the opportunity of starting all over again and to locate their farm buildings from the very first structure. The usual experience is, that the farmer has not had sufficient faith in the future development of his business. He builds his shelter belts, yards, buildings, etc., on altogether too small a scale, then when he has prospered far beyond his cramped quarters, the serious problem is "By what method may I make provision for my largely increased business by adding much needed and convenient buildings and yards without sacrificing practically all that I have put into my present home arrangement?" The usual decision is, to let the cramped quarters remain as they are, simply because it will cost too much to rearrange, and the new buildings and yards are added so that they have very little relation to the original home plan. These are not mere generalities, but represent the actual experience of the majority of settlers.

What it is desired to impress upon the mind of every settler is, that he should take ample time to plan out his home before spending a cent on improvements. The particular arrangement of the yards, buildings, etc., will depend upon the two following points:—

- (1) The special line of agriculture that is to be followed.
- (2) The extent to which that line will develop in say ten to fifteen years.

Do not skimp in the land that is to be allotted to yards, building site, lawns, garden, etc. In the foregoing plan we have suggested six acres.

This is not by any means too large an area. Many farmers have adopted ten acres for home buildings, etc., and have found that it could be utilized nicely. However, six acres for the ordinary farm may be found to be sufficient.

WATER CONVENIENCES.

Good water is of prime importance on every farm, both for household and stock purposes. If it is possible to secure a farm on which there is a living spring, near which the house and barns may be conveniently located, or if such a spring may be piped into the house, milk house and yards, it produces almost ideal conditions as far as a water supply is concerned. The next best thing is an artesian well. The vast majority of farmers have, however, to draw their water from a well by means of a pump. Where this is so, it will pay the farmer in most cases to install a windmill. With such power it is then possible to provide a supply tank in the attic of the house or in an elevated tank outside which makes all modern household conveniences possible. The water may then be piped to the dairy house and thus a constant supply is on hand for cooling milk and cream. From the cooling tank, the water may run to both horse and cattle drinking troughs. Every effort should be made to provide a convenient supply of pure water in sufficient quantity, for use of both man and beast.

WIND BREAKS.

As has been suggested, wind breaks may be made any width up to one or even two rods. It is a good plan to plant the trees quite thickly, say five to six feet each way. This plan protects the trees themselves, and besides will very quickly shade the ground and bring about forest conditions so that cultivation is unnecessary. It will be found to be a splendid plan to plant a double row of white or blue spruce in the wind break. While these are much slower in growth than the Manitoba Maple, Elm, or Balm of Gilead, yet when they do grow to any considerable height, there is nothing prettier than a substantial wind break of such evergreens.

THE FARM.

The general plans for the interior arrangement of farm buildings will vary somewhat according to the ideas of the individual. It is not our intention to go into interior arrangements here, but we wish to call attention to one fact in the construction of all buildings, and that is the necessity for abundance of light. Ninety per cent of barns or stables are provided with altogether too small windows. The fear seems to be that windows will make buildings cold in winter. Individuals forget, however, that where sunlight is absent, disease may flourish. Barns should be constructed so as to provide as much light as possible to the animals. In fact, the south side of cow barns and hog houses are all the better if they are practically all windows. Horse barns and poultry houses should also have ample light. Proper ventilation is also a point of great importance.

THE VIRTUES OF PAINT.

Each individual has, of course, his own idea as to color, but a general color scheme including all buildings should be adopted. In this connection it might be well to point out the value of paint. Many people leave this very important feature for several years, and by that time the lumber has become so checked that it requires double or treble the paint, and the effect is not as lasting. It is generally understood that a good coat of paint is worth three times its value in the preservation of the building against weather, and the easiest and best time to apply paint is as soon as the building is completed or during completion. No amount of labour in fixing up lawns, yards, or trees can take the place of a good coat of paint applied to all farm buildings.

FARM FENCES.

The appearance of the fences and gates about a farm add much to its attractiveness. It is generally a good plan to have a woven wire fence of some neat pattern in front of the grounds that surround the house. This does not necessarily need to be an expensive fence. Something simple and neat will do quite well. The front gate should, of course, match the fence.

Some strong, rather tightly woven wire fence should surround all stock yards, and it is generally a good plan to surmount this with a single strand of barb wire. This will prevent the horses, etc., rubbing their necks along the top of the woven wire, and thus slackening it. Frequently a nice effect may be produced by painting the front fence and gate posts or whitewashing the same. All wire should be stretched tight and no breaks should be allowed to remain unrepaired.

The subject of broken wires brings us to the very important point with regard to farm fences in general. Nearly all fences in the West are built with barb wire, and it is a notorious fact that this is responsible for many crippled and disabled horses. It is almost impossible to find a single farmer in the West who does not possess one or more horses that show evidence of severe cuts by barb wire at some time or other. Such wounds are so ragged and torn that they scarcely ever heal up without bad blemishes. It has been estimated that the loss of horse value in Alberta through barb wire cuts would easily pay the difference between the cost of barb wire and a good woven wire fence on every farm in the Province. A good practical fence is one constructed of woven hog wire to perhaps a height of 30 inches and then surmounting this with two or three strands of barb wire. This will turn all stock, including calves, colts and hogs, and there will be very little danger of injury to animals. This, besides making a good substantial and safe fence, is one that is not unattractive.

PART III.

AGRICULTURAL PRACTISE IN THE IRRIGATION BLOCK.

The following information is based on the experience of the most successful farmers in Southern Alberta and upon conclusions arrived at by the Company's technical staff on the Demonstration Farm at Strathmore and at other points in the Block. This information is given for what it is worth. We do not expect, by any means, that it is the last word on agricultural practise, but it is believed to be the most reliable advice properly compiled, that is available up to date.

THE SOIL.

The soil of the district which comprises the Irrigation Block is, generally speaking, of a light character. One part of the Block may differ somewhat from another, yet very rarely do we find the heavy clay soils that are so hard to work, and that may be found in other parts of the Dominion. This is decidedly an advantage to those who settle in the Irrigation district, for all who have had any experience know that the lighter chocolate, or dark colored loam that has a slight admixture of sand, makes the best soil for all classes of agricultural work. Such soils are what are termed "fast" growing soils, that is, crops make very rapid growth during the warm months of summer. These sandy loam soils very rarely "bake," and in fact three horses on this soil will do the cultivation as easily as will four on the heavier clay soils. This "fast" growing soil of the Irrigation Block, coupled with the very long growing days that are experienced in Alberta, make a wonderful combination for the farmer who is looking for a home where farming becomes a pleasure.

The unbroken portions of the Block are covered with a dense growth of prairie grass, which, in days gone by, furnished the pasture for the thousands of cattle that were finished for market on the open range. This dense and luxuriant growth of grass is indicative of the strength of soil underneath.

BURNING OFF PRAIRIE GRASS.

The prairie grass is so abundant in some cases that it is necessary to burn it off before it is possible to plow the sod. The dense growth of dead grass not only prevents the plow entering the ground, but it lies as a dry mass underneath the sod preventing the capillary movement of soil water, and hence the sod dries out. Where there is a heavy growth of dry grass it may be burned off, but this should not be done far ahead of the plow as the bare ground is exposed, and before the field may be plowed much



A 40-Acre Trace of Irrigated Oats, Grown During the Dry Year (1910) on C. P. R. Demonstration Farm.

moisture is lost. As each land is opened out with the plows, the grass lying between may sometimes be burned off to advantage. However, where the grass is only a few inches tall, it is not necessary to burn off the field as a heavy packer will flatten out the furrows and the grass is saved for its fertilizing value. Where possible this is the wise thing to do.

"ALBERTA LAW REGARDING BURNING OFF OF GRASS OR STUBBLE."

"From Chapter 87 of the laws of 1898, as amended in 1903."

CLEARING LAND.

Sec. 4. No person shall directly or indirectly, personally or by any servant, agent or employee, kindle on any land a fire for the purpose of guarding property, burning stubble or brush or clearing land unless the land on which the fire is started is at the time it is started, completely surrounded by a fire guard not less than twenty feet in width consisting of land covered with snow or water, or so worn, graded, plowed, burned over or covered with water as to be free of inflammable matter, and any person kindling a fire for such purpose shall, during the whole period of its continuance, cause it to be guarded by three adult persons provided with proper appliances for extinguishing prairie fire.

Any person contravening this section shall be guilty of an offence and be liable on summary conviction thereof to a penalty not exceeding \$100.

SPRING BURNING.

Sec. 6. Nothing herein contained shall prevent any person from kindling fire before the 7th day of May in any year for the purpose of clearing any area of land not exceeding three hundred and twenty acres if such land is completely surrounded by a fire guard not less than ten feet in width, consisting of land covered with snow or water or being so worn, graded, plowed, burned over or covered with water as to be free from inflammable matter.

BREAKING THE SOD.

While we believe breaking should not proceed later than the first of August in ordinary years or on land that is not irrigable, we believe that by properly applying water, the land may be broken up as late as the first of October with good results, but under no consideration would we advise the breaking of land beyond that date. Water should be applied at least ten days or two weeks before the breaking is done in order that the ground may be in the very best possible condition.

It will be well to break no more than can be done properly and worked thoroughly. When land is broken very early in the season, much of the vegetation is not killed, and soon accommodates itself to changed condi-

tions, continuing to grow; while when plowing is done after the growth of grass has advanced a little, most of the herbage will be killed.

There are "special" breaking plows with twelve to fourteen inch shares, and just recently a plow has come before the public that turns a furrow 22 inches wide.

A question which has been debated considerably is as to the proper depth to break; some advocating 3 to 3½ inches, while others advise 5 to 6 inches. We think that the depth of breaking ought to be determined by two things—first, the character of the soil, or sod; and second, what we intend to do with the breaking.

If a man has the capital and can do so, we believe the following is perhaps the best method to pursue: break to 3 or 4 inches, follow with a heavy roller or packer to press the sods flat upon the plow sole. This is done to exclude the air, and to press the grass tightly against the damp undersoil so that it will decay rapidly. Follow with a double discing lengthwise of the plowing. A stroke with the harrows, with the teeth set slanting backward, will be found to be beneficial in filling up the chinks between the furrows, and thus aiding in the decaying of the sod.

From six weeks to two months later the field may be replowed in the same direction but an inch or so deeper. This is called "backsetting." This plan brings on top an inch or two of loose mould from beneath, and a stroke or two with the disc will make a splendid seed bed.

If the sod has been thoroughly irrigated just previous to breaking, and if the breaking has been done during May, or the forepart of June, then it might be possible to sow fall wheat. This, however, should be sown not later than the last of July. Land that cannot be gotten ready for fall wheat by the last of July should be carried over for spring seeding.

Where fall wheat is not sown then the tillage of the soil may continue throughout the summer by an occasional harrowing, and the land will be in excellent condition for oats or wheat the following spring.

We frequently find, however, that there are those who must realize a cash crop the first year, and while we recommend the foregoing method, yet there is a probability of realizing a cash crop the first summer with flax.

In this case we would recommend breaking 5 to 6 inches deep to give sufficient earth to "work up" with the discs and harrows. Follow the breaking with a heavy roller or packer as before, and then give a stroke or two with the disc, and, if necessary, one with a harrow. Flax may be seeded at the rate of 30 lbs. per acre, but should be sown between the 5th and 20th of May. Fall wheat has also been sown on breaking of this character, which has been previously irrigated, with satisfactory results.

Never under any circumstances break great areas and leave the sod furrows to bake and dry in the sun. In all cases breaking should be followed up immediately with the packer, discs and harrows. The work of pulverising the sod can be accomplished much more thoroughly, and much easier, immediately after the breaking.

Settlers in the Irrigation Block frequently arrange with neighbors for the breaking of small areas of their farms prior to settlement, so that they may not be delayed in producing results.

COST WHEN HIRING WORK DONE.

Probably a table of the prevailing cost of breaking, discing, harrowing, seeding, fencing, etc., might be of interest to those who wish to engage neighbors to do work on the land prior to taking possession:

Breaking, 3 inches	\$3.00 per acre.
Breaking, 5 to 6 inches	4.00 per acre.
Plowing stubble	\$2.50 to 3.50 per acre.
Discing, each operation .....	.50 per acre.
Harrowing, each operation .....	.35 per acre.
Seeding, each operation .....	.50 per acre.
Treating grain with formalin, or bluestone	3c to 5c per bushel.
Fencing, 3 wires, posts 1 rod apart	\$125 to \$150 per mile.
Fencing, 3 wires, posts 2 rods apart..	\$100 to \$120 per mile.
Fencing, 4 wires, posts 1 rod apart	\$140 to \$165 per mile.
Boring wells, using steel casing	\$2.25 to \$3.00 per foot.
Boring wells, using galvanized casing	\$2.00 to \$2.75 per foot.
Boring 2 ft. to 3 ft. wells, and furnishing 2 in. cribbing,	\$2.25 to \$2.75 per foot.

SEED DRILLS.

There are various kinds of seed drills available, and it is not our intention to recommend one above another, but there is one thing that we must bear in mind—the soils of the Irrigation Block are very friable and easily worked, and because of this very fact it is best to pack the earth round the seed after seeding, for quick germination.

It has been found that the press drill is by far the best implement for seeding. Most of the companies are making a wheel pressing attachment for the ordinary drills. Where press drills are not available, it is necessary to follow up the seeding with a regular packer.

CROPS AND SEEDING.

It has been found that a crop from thin sowing usually takes longer to ripen. On irrigated land there cannot be any doubt that fairly heavy sowing should be resorted to as economy of moisture is not in that case a serious object, and thick sowing will hasten maturity.

The Dominion Experimental Farms system has only recently been extended to the Province of Alberta, and our own experimental farms are of such recent origin that it is difficult to give conclusive data with regard to the proper time for seeding each grain, and the quantity to use. Certain conclusions have, however, been reached through the actual experience of farmers in the Province covering the past twenty years or more, upon which the following observations are based.

Barley, Two-Rowed.—The demand for irrigated two-rowed barley is almost inexhaustible, and this crop will, therefore, ultimately become one of the most valuable in the Irrigation Block. The only variety to sow is

the Gallatin Valley barley, which is a variety of the Chevalier. This can be obtained Alberta grown, and will do better than the imported barley. Two-rowed barley matures somewhat later than the six-rowed variety, and should, therefore, be sown fairly early. It would be well to have two-rowed barley in the ground before the 10th of May. Quantity of seed per aere, two bushels.

Barley, Six-Rowed.—This is, perhaps, the earliest maturing cereal produced in Alberta, and should be sown prior to the 15th of May. The average period of maturity is about 97 days. If sown on summer-fallow land,



Two-Rowed Chevalier Barley Produced 48.8 Bushels per Aere. Irrigated Onee. C. P. R. Demonstration Farm.

maturity is generally delayed four or five days. The best time to sow is as near the 10th day of May as possible, or earlier if the season justifies it. Quantity of seed per aere, two bushels.

White Hulless Barley.—This is a variety of the six-rowed barley, and, as its name implies, is a hulless variety. For this reason it is greatly in demand for stock feeding. It takes the place in the ration, of the corn of the States, and is excellent as a fattening grain. Pork and bacon finished with

this barley is sweet and of excellent flavor. It ripens in from 100 to 110 days, and should be seeded at the rate of two bushels per acre.

Field Peas.—Peas intended for ripening require 110 to 112 days for maturing, and should be sown as early as possible. They make a very paying crop on irrigated land. Quantity per acre under irrigation would be two bushels of the small variety and 3 to $3\frac{1}{2}$ bushels of the large variety. The smaller varieties are generally preferred. Peas should never be broadcasted, but should be drilled in deeply. This is of great importance.



Field Peas, Six Feet Six Inches Tall, and Producing 36 Bushels per acre.
Irrigated Once.

If peas are to be sown on newly-broken land and a press drill is not available the seed may be disseed in, but this plan is not recommended. Before the seed appears above the ground a light harrowing is recommended.

Spring Wheat.—Opinions are undivided as to the proper time to sow Spring Wheat. This grain should be seeded as soon as it is possible to cultivate the land in the spring, and it is not generally a success on spring-plowed land. It should be sown either on summer-fallowed or fall-plowed land. Quantity per acre, one to one and a quarter bushels on non-irrigated and one and one-quarter to one and a half on irrigated land.

Winter Wheat.—The best farmers endeavor to have their seeding done during the last two weeks of the month of July. It is good practice to put the grain in not less than three inches in depth. This is perhaps the most successful grain crop that Southern Alberta produces.

The critical time with winter wheat is in the spring when the warm weather commences very early, and where there is a heavy call upon the soil moisture by evaporation. A few spring showers generally come during May or June, but the harm is done before these showers arrive, or, in other words the winter wheat is hurt by the extremely dry weather before the shower season. Under irrigation this is not the case, because it is possible to irrigate the land before sowing in July, and this so fills up the soil that the crops never suffer in the spring for want of water.



Banner Oats, Irrigated Once, which Produced 76 Bushels Per Acre.

Winter or "spring drought" killing is very rare under irrigation. In fact, with proper irrigation, and deep and early seeding, it is almost entirely eliminated.

Winter wheat is nearly always sown on summer-fallowed land, but may be put in on land broken deep in the early summer and thoroughly irrigated and disced before seeding. The finer the seed bed is pulverized, the more certain the farmer is of good returns. Quantity of seed per acre, the same as spring wheat.

Oats.—At one time there was considerable diversity of opinion as to the merits of putting in oats prior to the first of May. It is, however, pretty well acknowledged now that early seeding of oats is good practice. Oats sown even as early as April 15th have produced splendid crops. This cereal is a fairly early ripener. The number of days for maturity range from 110 to 118. It is not, therefore, nearly as essential to sow oats early as, for instance, spring wheat. As a general rule oats put in as late as the 10th of May are a safe proposition. Quantity of seed per acre, two and one-half bushels.

Flax.—This is an early ripening crop, taking about 102 days to mature. It may be sown any time after the 5th of May and as late as the 20th of May. The quantity of seed per acre that has given best results is thirty pounds.

Flax is the settler's safest spring crop on newly broken land. It will respond to the crudest methods of cultivation and give fair results, and will get along nicely without an abundance of moisture. Many farmers have added a considerable amount to their capital by growing flax as the first crop on their land, as the price is generally good.

Potatoes.—The common practice in Alberta is to put in potatoes during the second week in May. They are generally sown at the rate of eight to ten bushels per acre. Potatoes will be one of the main crops of the Irrigation Block, as maturity can be hurried by the judicious application of water at certain stages of the growth. The best potatoes are invariably grown under irrigation.

The proper method of growing potatoes under irrigation is to give one good flooding of water shortly after the potatoes have appeared, and then cultivate three or four times.

As a usual thing, one irrigation will be found to be sufficient, unless an extremely dry year is experienced.

Turnips.—As a usual thing turnips may be seeded as late as 15th to the end of May and the first week in June. Early seeding is not so essential, as the turnip goes on developing for several weeks after killing frosts have made their appearance. Once in a while cut worms appear, and are troublesome with this crop, but under irrigation this will be found to occur but rarely.

Sugar Beets.—It is considered good practice to sow sugar beets during the second week in May. The quantity of seed per acre is 15 to 17 lbs. The Company has at its Demonstration Farm beet drills available, which may be used by new settlers, providing arrangements can be made to spare the drills at the time they require them.

The sugar beet industry has been carried on to a considerable extent in Southern Alberta, and the beets grown in the Irrigation Block are of a very good quality, showing a high percentage of sugar. Heretofore the Canadian Pacific Railway has arranged to reduce its transportation charges on beets grown in the Irrigation Block east of Calgary, to the nearest sugar

factory located some 200 miles from that city. The net price being paid for beets F.O.B. cars nearest station, is approximately \$5.00 per ton.

There is one thing, however, that must be borne in mind, and that is, that, as a rule, it is unwise to attempt to grow sugar beets extensively until such time as the prairie sod is decomposed, and the seed bed deepened. Sugar beets grow to a depth of 8 to 12 inches, and it is better to have them grow deep in the earth so that they are completely covered up with soil. Thus it will readily be seen that it is unwise to sow beets on new breaking, or in fact on any land until it has been worked, and thoroughly prepared to a depth of 10 to 12 inches.

Sugar beet culture is one that yields splendid returns where the grower gives care and attention to the work. Settlers must guard against expecting large returns where this close attention and cultivation is not given. Probably 90% of the beets grown in America are produced in the irrigated States of Western United States.

The average price paid for beets for the whole of the United States, according to the last census, was only \$4.18 per ton. In the State of Minnesota a minimum price of \$4.25 per ton has been established by law. The price paid for beets in Utah, one of the foremost of beet growing states, was \$4.25 a ton, with an average yield of 11.4 tons an acre.

Timothy.—This makes a splendid hay crop under irrigation. It is generally sown with a nurse crop, if possible, barley. The best results have been obtained by drilling in one and one-half bushels of barley per acre and broadcasting the timothy crosswise, afterwards giving it a stroke with the drag harrows, preferably with the teeth somewhat slanting. It may be sown immediately after the grain crop, while the soil is moist. The wheelbarrow seed sower may be profitably used where the farmer is not experienced in broadcasting by hand, or grass seed attachments may be secured for the ordinary drills. Seeding timothy by a drill mixed with other grain is not a good practice, as it is generally buried too deep and makes little or no hay the second year. Good results are generally obtained by sowing between 10 and 12 pounds. On irrigated land the seedling may be somewhat heavier than on non-irrigated land. Some authorities recommend sowing as much as 30 pounds per acre, which, however, would be excessive: 12 to 15 pounds would perhaps be sufficient for irrigated land.

Bromus Inermis, or Awnless Brome Grass.—This grass has been very extensively grown in Western Canada and the United States, particularly in districts where the rainfall was somewhat scant. For the production of hay on non-irrigable land, brome grass, as it is commonly called, gives very good results. There are, however, serious objections to this grass under irrigation, namely, its tendency to spread and the difficulty of killing it out. It grows with running root stalks, the same as couch grass and sweet grass, which are regarded as very bad weeds, almost impossible to eradicate.

There is therefore no necessity for producing brome grass on irrigated land, as more valuable fodder crops can be grown in profusion, and there is, therefore, no object in running the risk.

Where brome grass fields on non-irrigable lands require renewing, a simple method of doing so is to plow the land shallow and roll it, when profuse growth will again take place until such time as the roots get matted and require renewing. A stroke of the disc harrow has in some cases been found sufficient. While the merits of brome grass cannot be disputed, it is not good farm practice ever to introduce a crop that cannot be readily eradicated.

Western Rye Grass.—This grass produces quite as heavy crops as brome grass and can readily be eradicated when desired. It is, like timothy and brome, a perennial, and, properly speaking, a bunch grass. In fact, it is a native of Alberta, and is found in profusion on the bunch grass ranges. This is one of the hardiest grasses, and is suitable for either irrigated or non-irrigated land. It should be sown with a nurse crop at the rate of about 15 pounds of seed per acre, in the same manner as timothy.

Green Oats Hay.—A very favorite hay crop for many of the new comers to the Bow Valley is oats cut green. The ground should be prepared as for the regular oat crop, but we should seed from $2\frac{1}{2}$ to 3 bushels per acre. It is also a good plan to sow about a gallon of peas to the acre with the oats. About the time the crop gets eight inches to fifteen inches tall, a good heavy irrigation may be given. This will, as a rule, be sufficient. The crop may be cut with the ordinary binder, only the bundles should be made somewhat smaller than for the grain crop. The bundles should be shocked up soon after cut in rather open shocks, so that they may dry thoroughly. It is also a good plan not to tie the bundles too tightly, as they are apt to mould. Cut when the tip oats begin to whiten, and before the substance has passed out of the stems. This makes a very excellent hay. The peas are an advantage in the mixture in case it is the intention to cut the oats with a mower. When ordinary oats are cut with the mower it is hard to rake the crop up clean. The peas bind the stems together somewhat, and make raking possible.

Fall Rye (Pasture).—For those who wish very early spring pasture for dairy cows or other stock, fall rye sown during the latter part of August on thoroughly prepared soil will give splendid results. It may be sown on new breaking which has been irrigated and thoroughly cultivated, or on summer-fallow.

It comes up with the first warm days of spring, and produces an abundant pasture. Care should be exercised in never letting it come to head, especially when dairy cows are being pastured, as ergot (an affection of the kernels of the head somewhat similar to smut in wheat) may appear, and authorities think that it will produce abortion.

Seed 2 to $2\frac{1}{2}$ bushels per acre. The crop may, of course, be allowed to ripen for seed.

Rape (Pasture).—This is a leafy plant which grows similar to the top of a turnip, and which makes very excellent hog pasture. It may be cut or pastured off, and with irrigation will grow up just as strong a second and

third time. An acre will produce feed for 10 to 15 hogs for most of the summer. A favorite hog pasture for summer would consist of 1½ bushels rye, 1 bushel oats, and 6 lbs. rape. Mix seed up thoroughly, and seed with ordinary grain drill. It may of course be broadcasted by hand in small lots.

GARDEN VEGETABLES.

The Irrigation Block with its fast growing and sandy loam soil is indeed the home of the vegetable garden. Scarcely a vegetable can be named that will not do wonderfully under irrigation, cabbages, cauliflower, Seotek kale, carrots, beets, parsnips, turnips, radish, beans, peas, onions, lettuce, asparagus, etc., etc., are but a few that might be named. These products find ready sale in Calgary, a city of 55,000 inhabitants, as well as in the



Irrigated Garden Vegetables.

numerous, fast growing towns in the Block. The marvellous railway development in Alberta also calls for large quantities of vegetable products in their construction camps.

SHADE AND FRUIT TREES.

One of the most attractive features of the irrigated district is the facility with which trees of all sorts suited to the district can be grown. In the older irrigated sections of the United States, entire farms are often sur-

rounded by large shade trees, and present a most attractive appearance. Every settler of the Canadian Pacific Railway Irrigation Block should make it a point to start tree plantation at the very earliest moment. Nothing makes a home more attractive than the presence of well-grown trees, and it is astonishing the rapid growth that can be procured where an abundance of water is available for irrigation. Under irrigation there is no limit to the amount of tree planting that may be successfully carried on. Even without irrigation, on thoroughly prepared and summer-fallowed land, good success is met with in planting the native trees of Alberta.

GOVERNMENT ASSISTANCE.

In order to encourage the planting of trees on the plains, the Dominion Department of the Interior some years ago established a Forestry Department at Ottawa, and obtained the services of a number of technically qualified men. A large amount of money was then appropriated for supplying settlers in Western Canada with trees free of charge. The Government also established a large tree plantation in connection with the Experimental Farm at Indian Head, Saskatchewan, and the policy has worked out with eminent success. All settlers on the Irrigation Block who wish to go in for a tree plantation on their farms should apply to the "Dominion Superintendent of Forestry, Department of the Interior, Ottawa, Ontario," when full information will be sent them with the necessary blank forms of application. Owing to the fact that the demands upon the Department have been so heavy, it is necessary that early application be made. Tree planting applications received during the Spring of one year, can seldom be filled until the following year. The Dominion Government in the meanwhile sends an experienced forester to your farm who will discuss the whole situation with you and will make a sketch of the proper places to put in the trees and give complete directions as to preparing the land and the manner of planting. When the proper time comes the trees will be sent you free and with all express charges paid, so that you are under no actual expense whatever in getting your plantation started.

With such a favorable arrangement available there is absolutely no excuse for the absence of trees on any farm in Western Canada, and, furthermore, where irrigation is available it almost becomes a crime not to have a tree plantation started at the earliest possible moment. Tree plantations under irrigation have reached a growth of fifteen feet during the first three or four years in Southern Alberta, and every colonist owes it not alone to himself and his family, but also as a public duty, to place himself in communication with the Dominion Forestry Department at the earliest possible moment, even before he has his land broken, and make all arrangements for starting a tree plantation as soon as he is in a position to provide land cultivated in accordance with the directions of the Dominion Government.

On the Demonstration Farm at Strathmore, the Canadian Pacific Railway have about 150,000 trees growing that will be distributed to the settlers in the Block at actual cost.

These consist largely of Manitoba Maples, with a few Larch, Golden Willow and Caragana.

FRUIT TREES.

Standard apples, crab apples and plums have been produced in nearly every portion of the Province of Alberta. It is, however, most desirable that before attempting to produce large fruit an effort should be made to get a forest plantation and shelter belt started in order to provide the necessary



Irrigating 150,000 trees which are being grown on C.P.R. Demonstration Farm for Settlers in Irrigation Block.

protection from the winds that prevail on the treeless plains. With the judicious application of water no reason exists why these fruits should not be profitably and plentifully produced in Southern Alberta.

The varieties of crab apples that have proved to be most successful are the "Transcendent" and the "Siberian." The most successful standard apple is, perhaps, the "Duchess of Oldenburg" and the "Patten's Greening." The Manitoba Wild Plum produces plentifully, but is not of a very high quality. It is very essential in sending for fruit trees to insure that these trees have been grown in Western Canada. Nurseries have been established at Virden and Brandon in the Province of Manitoba, and all the requirements of farmers in the Irrigation Block can be met from there.

STRAWBERRIES.

It has been proven beyond a doubt that strawberries grow abundantly in the Irrigation Block. The berries are large and luscious, and the yield is remarkable. Alberta strawberries also have the advantage that they are produced at a time of year when there are no other competing berries on the market. By mulching them with a light litter in the fall, they winter exceedingly well, and by removing this mulch at any desired time in the spring, the date when the berries ripen may be controlled almost perfectly: thus the berries may be brought on to the market when most in demand.

An acre of Willson strawberries were planted out on the C.P.R. Demonstration Farm at Strathmore during August, 1909, and came through the winter with practically a perfect stand. During 1910 over \$60 were realized in berries, while during 1911, \$510.00 were the gross receipts for this acre crop. After deducting \$200.00 for picking, boxing, shipping, etc., it leaves a net profit from one acre of \$310.00.

The mulch was removed from this crop during the first week of May, which brought the berries on to the market during the months of July and August. At this time there were no competing berries on the market, consequently a ready sale at good prices was the result for the entire crop.

Alberta's soil, climate and market will make strawberry culture very profitable. This, coupled with the fact that irrigation is possible whenever needed, makes the crop very abundant and profitable.

SMALL FRUITS.

There is not the slightest difficulty in producing almost all varieties of small fruits. White, red and black currants grow profusely, and raspberries give good returns, particularly when bent down in the fall of the year and covered with straw or other litter. Gooseberries also grow splendidly. Under irrigation small fruits of the finest quality have been produced in Southern Alberta for years, and there are also a large number of orchards where raspberries and currants are produced on non-irrigated land.

FARMING ON NON-IRRIGATED LANDS.

While this booklet is chiefly intended for those who are farming on irrigated lands, it is not by any means asserted that the non-irrigated, or as they are sometimes called, "dry" lands, of Southern Alberta are not most productive in regard to the ordinary cereal crops and certain large deep-rooting grasses that do not require a large quantity of moisture.

It may be at once asserted that to farm successfully on non-irrigated lands, not alone in Southern Alberta, but in the southerly portions of the Provinces of Manitoba and Saskatchewan, it must be done on summer-fallow land. The best farmers in the famous Indian Head district conduct their farming operations almost entirely on land that has been fallowed the previous year. This is also the case on the great winter wheat farms of Washington, Oregon, Idaho, and Montana.

The tendency of modern agricultural investigation in the American West has undoubtedly been chiefly to introduce crops and system of culture

that will produce the best results with the most limited quantity of moisture. The aim and object of modern methods of cultivation is essentially the preservation of soil moisture. Colonists starting in on non-irrigated farms within the Irrigation Block should recognize the fact, that the most successful results will invariably be obtained on lands summer-fallowed as early in the season as possible, and then followed by vigorous harrowing, especially after the occurrence of showers. The great crop on Southern Alberta non-irrigated lands is winter wheat, which lends itself particularly well to the introduction of the summer-fallow principle.

Professor Campbell, of Nebraska, has written a book entitled "Campbell's System of Dry Land Farming," which covers the subject very thoroughly.

In 1909, William McDonald, Agronomist, Transvaal Department of Agriculture, published a very excellent book on "Dry Farming" (New York: Century Company). This gave the very latest thought up to the date of its publication, but this year (1911) Professor John A. Widtsoe, President, Agricultural College, Utah, publishes what is the most complete authority on "Dry Farming" to date (McMillan Publishing Company, New York). The Montana Agricultural College, Bozeman, Montana, has also published a number of very excellent bulletins on this subject, which are free for the asking.

ALFALFA

If history repeats itself in the Canadian Pacific Railway Irrigation Block, there can be no doubt that alfalfa will very soon become the leading crop upon the irrigated lands of that vast area. In the Western States, from 70% to 80% of the entire irrigated area is devoted to the production of alfalfa, which has rightly been called "The King of Forage Plants." The plant produces the greatest quantity of feed per acre on irrigated land of any crop known to man. It is compared in feeding value to bran. Alfalfa has made rich the farmers on irrigated lands all over America and the facility with which this crop can be grown in Alberta makes it indisputably the most valuable of all crops raised under irrigation. Under these circumstances, and in order to impress more particularly upon the minds of settlers of the Irrigation Block the great importance of preparing their land for alfalfa at the earliest possible moment, it has been decided to deal separately in this publication with the whole subject of alfalfa production.

Its Importance.

Alfalfa, or lucerne, is a leguminous crop, and is generally recognized to-day as the greatest fodder crop grown, for all classes of farm stock. Timothy used to be regarded as the greatest fodder for working horses, but it has been proven by actual test that alfalfa is much superior as a horse food. It is also by far the best hay for dairy cattle. Aside from its value as food for horses, cattle, sheep, swine and poultry, it has a wonderful influence in keeping up the fertility of the soil.

Because of the extreme importance of this crop, both as a food for stock, and as a soil enricher, we shall give considerable time to the planting, growing and harvesting of alfalfa for hay.

Every indication at present points to the fact that the irrigated lands of the Bow Valley in Alberta will be one of the greatest alfalfa districts on the Continent. At Lethbridge, in Southern Alberta, it has been grown for years with wonderful success. On the Canadian Pacific Railway Demonstration Farm at Strathmore it has only been tried for three years, but such success has been attained that we are safe in saying that the soils of the Bow Valley are admirably adapted to this king of fodder crops.



Alfalfa, "King of All Fodder Crops," Grown on C. P. R. Demonstration Farm, and Producing Three Tons per Acre in Two Cuttings the First Year. Irrigated Twice.

Seed Bed.

As a rule it is unwise to seed alfalfa on new breaking. Several grain crops should be taken off the land so that the prairie sod is thoroughly decomposed.

The seed bed should be in fine tilth. One that is too open and loose is not desirable, neither should it be hard or lumpy. As the alfalfa seed is

small, the particles of earth need to be fine and mellow, so that the moist earth may surround the seed completely and snugly. In this way germination is much more rapid and sure. Plant on a clean piece of ground.

Inoculation.

Some little difficulty may be experienced in getting a stand of alfalfa the first time, and this may be due to the fact that the soil needs inoculation. That is, the right kind of germ needs to be introduced in order that the crop may grow successfully.

There are two methods of doing this, the earth, and nitro-culture methods.

The earth method simply consists of taking earth from a field where alfalfa has been growing successfully and sprinkling it upon the field to be sown, just prior to the sowing of the alfalfa seed. Anywhere from 200 to 400 lbs. of earth may be used per acre.

The nitro-culture method is where the germs are secured from some Agricultural College, and are sprinkled over the seed in a somewhat similar manner to the treatment of grain for smut. Both plans are good, but the soil method is perhaps the simplest and best. It is a good plan to get an acre or so of land inoculated first, and then from this it is a simple matter to inoculate larger areas.

Seed.

Be careful to get the very best and cleanest northern grown seed available, and secure it as near home grown as possible. In Alberta farmers are fortunate in being able to have all seeds tested free by the Dominion Seed Laboratory at Calgary.

Amount of Seed per Acre.

On new land where inoculation is necessary as high as 20 lbs. per acre has been sown, but where the seed bed is well prepared, we think fifteen to seventeen pounds ample. After the crop is firmly established, twelve and even ten pounds will be found to be sufficient.

Time to Sow.

Alfalfa is one of the hardiest crops grown. However, it may be killed with a hard frost just after the seed has sprouted, and the young plant appears. From the middle to the end of May is perhaps the best time for seeding in the Bow Valley. After the first year, and when the plants become deeply rooted, it will stand almost any degrees of frost.

Method of Seeding.

The seed may be broadcasted, or sown with a "wheel-barrow seeder," then followed by a stroke of a light drag. Ordinary grain drills, as a rule, cannot be shut up tight enough to seed less than 25 to 30 lbs. per acre, and for this reason cannot be used. However, most grain drills have extra grass seed attachments that will do splendid work in seeding alfalfa. Soils

in the Bow Valley may be benefited by running the packer over the field after seeding alfalfa.

Nurse Crops.

The best results have been secured so far by sowing without a nurse crop. However, some farmers are getting fair results by seeding with a light crop of barley (seeded one bushel to the acre).

Until the crop is fairly established, we think the better plan is to sow without a nurse crop.

Care of Alfalfa During First Year.

No crop should be looked for the first year. When plants are six to ten inches high, run a mower over it, and leave the clipping on the ground. This strengthens the crown of the plant, and causes a heavier stooling, which gives a finer and much heavier crop.

Unless the weather is extremely dry, no irrigation will be required the first year. Withholding moisture induces deep rooting, which is very desirable.

Fall and Spring Treatment.

Do not "pasture off" late the first year, but leave the stalks of alfalfa to collect the snow during the winter.

In the spring run a light harrow, or disc, over the alfalfa field. This will help to make an earth mulch for the retention of moisture, and will also tend to split up the crown of the plant, and thus induce stooling.

Second Year.

The crop will need little or no attention up until the time of irrigation, and because of the fact that most of the rains come in May, or June, the irrigation may sometimes be postponed until just before cutting. Irrigation at this time will start the second growth immediately after the first crop is removed. This plan will sometimes gain a week's growth for the second crop. Judgment will, of course, have to be exercised in applying water in advance of cutting to insure that when the crop is ready for cutting, the land is in good condition to work the mowing machine, and do the hauling.

Cutting and Curing.

Cut with the appearance of the first bloom. Let the hay wilt for four to six hours, and then rake into winrows and cock up into heaps of about a large forkful in size. Let sweat, and thoroughly dry in these small cocks. This plan will save practically all the leaves, which are the most valuable part of the plant. Before drawing in, turn the small hay cocks upside down so that the bottoms are thoroughly dry.

Marketing Alfalfa.

The method that will bring the greatest return is to market the alfalfa to the stock on the farm. Alfalfa hay is worth \$20.00 per ton when fed to dairy cows, and when so fed, 80% of the value of the crop is returned to the land as manure. Aside from this there is the fertilizing value of the crop

itself upon the soil. It is an actual fact that the longer alfalfa is grown upon the soil the richer it becomes.

Yield of Alfalfa.

It is interesting to note the enormous tonnage of alfalfa when compared with other hay crops.

The following figures compiled by the Kansas Agricultural College bring out this point very clearly:—

Name of Hay.	Pounds per Acre.
Alfalfa	7345
Red Clover	5490
Timothy	4779
Bromus Inermus	2892
Tall Oat Grass	1707
Meadow Fescue	1666
Orchard Grass	1414

Life of Alfalfa Field.

When once firmly established they will last indefinitely. Fields are known in Mexico and Texas that are 50 years old.

Old alfalfa fields need frequent severe harrowings or discings to split up the crown of the plant, and thus prevent its growing in immense heads. The running of machinery, the tramping of the horses, and the packing by heavy rains all tend to pack the soil, and the harrowing and discing are further beneficial in opening it up, and admitting the air.

Place of Alfalfa in Rotation.

Grain crops impoverish the soil, and, contrary to the belief of many, summer fallow does not restore plant food. Alfalfa, however, restores nitrogen, one of the chief elements of plant growth. Hence alfalfa should be grown continuously for from 6 to 8 years, and then should be plowed down. It will be found that the soil is actually richer after this 6 or 8 years' cropping than when the alfalfa was first sown. The benefit of such a crop in the rotation becomes at once apparent.

Note.—By referring to the article on the 80 acre farm a rotation of crops will there be found that may be applicable to any sized farm.

Value of Alfalfa for Various Farm Animals.

It is the most valuable hay grown for all heavy work horses, beef cattle, sheep and dairy cows. For hogs it is being used more extensively every year, and for poultry and egg production steeped alfalfa is regarded very highly.

Alfalfa for Pasture.

For pasture purposes and especially for dairy cows and hogs, alfalfa has no superior. Care should be exercised in turning hungry cows on to alfalfa after a frost that has wilted the tops, as there may be danger from bloat. However, if a little caution is used to give the cows a feed of dry hay before being turned to pasture, no danger may be expected.

Alfalfa on Dry Land.

Alfalfa reaches its highest stage of development under irrigation, and yet many would like to grow it upon dry land. It has not been proven, however, that alfalfa may be grown successfully on dry land. While we have heard of cases where it has been grown, and where one crop of perhaps one-half, to three-quarters of a ton has been the result, yet these cases are rare, and we would caution against an extensive seeding on dry land until satisfied that good results may be looked for.

TREATMENT OF SEED GRAIN, WEEDS AND OTHER PESTS.

It is characteristic of all countries with abnormally rich soils, that the pests which follow in the wake of agriculture everywhere, find conditions so favorable that eternal vigilance is required to keep them down. Alberta is as yet a comparatively new district, and these pests have not, therefore, as yet gained any considerable foothold, but it is a duty every farmer owes to himself and the community to wage fierce war on weeds, injurious animals, insects and parasites. The little time and labor bestowed on this object is generally repaid a thousandfold.

Seed Grain.

Investigations covering a number of years have conclusively proved that there is no agricultural loss as considerable as that due to the use of inferior seed grain. Every settler should satisfy himself that his seed grain is clean, well matured, and of the very best variety.

Seed Selection.—A simple method of maintaining a good strain of clean seed on the farm is to hand pick each year enough to seed one acre of land. This may be done with oats, wheat, barley and peas. Many of our most successful farmers do this work in the winter, and continue to do it each year. The tendency is, therefore, to get pure seed from the acre for seeding the next spring. In fact there are farmers in the West who have made a fortune by this simple method of hand-selection of grain.

Some carry this hand-selection one step further, and commencing when the first crop is ripe, hand pick a number of the best formed and earliest ripened heads of the various grains. These are carefully shelled, and sown in a small plot in the garden the following year. All inferior heads are removed from those small plots, and in that manner the very best and cleanest of seed grain can be developed within a few years. Those who can afford to do it will be able to purchase seed grain from farmers who have obtained quantities of good seed by following out this method.

Change of Seed.—The idea that a change of seed is necessary periodically, is entirely erroneous. If grain "runs out," it is due to shiftless farming and failure to provide a good foundation, and not to any inherent weakness in the seed itself. As a matter of fact, the longer any sample of grain is grown on a farm, the better it should adapt itself to the peculiar conditions of that particular farm and district.



Seven-Inch Kubanka Wheat, Strathmore, Alberta, C.P.R. Demonstration Farm. Irrigated Once and Growing to Over Five Feet in Height.

Seed Testing.—The Dominion Government has maintained for a number of years, at Calgary, a branch office of the Dominion Seed Laboratory. The mission of this office is to test, free of all charge, samples of seed grain sent in by farmers. Before you finally purchase seed grain, obtain samples of it and send it to the Laboratory for report.

Object of Seed Testing.—The object of testing seed for farmers and seed merchants is to provide for their own information a summary report giving data in the simplest possible form, showing the qualities of the seeds in respect to (a) purity (the presence of useless and noxious weeds), and (b) the percentage of germinable seeds. The inherited productiveness or quality of the plants or crop which may be produced from seeds cannot be determined in a Seed Laboratory.

Where to Send Seeds for Testing.—All kinds of field and garden crop seeds will be tested for purity and vitality, free of charge, to farmers. All samples of seeds for test from the Province of Alberta should be addressed to the "Dominion Department of Agriculture, Seed Laboratory, Calgary." Packages addressed to the Seed Laboratory at Calgary will not be accepted from the post office unless the postage on the samples has been prepaid.

To Secure Representative Samples for Test.—In order to insure that the sample sent for analysis accurately represents the bulk from which it is taken, the seed should be well mixed and small quantities taken from different parts to make the sample sent for analysis. If it be impracticable thus to mix the seed, small quantities may be drawn by means of seed tryers from the top, middle and bottom of each bag when there are not more than six bags; from the top, middle and bottom of every second bag when there are seven to twelve bags; and from the top, middle and bottom of every fourth bag when there are more than twelve bags. The small quantities thus drawn may then be well mixed to make the sample for analysis.

Size of Sample for Ordinary Purity Test.—The size of sample sent for purity test should not be less than: One ounce of grass seeds of all kinds, or of white and alsike clovers; two ounces of red clover, alfalfa, millet or other seeds of like size; one-half pound of cereal grains or other large seeds.

Size of Samples for Germination Test Only.—For germination test only, samples of smaller size will suffice, but in any case these should not be less than approximately 2,000 seeds of grasses and clovers and 1,000 seeds of cereal grains.

If you have not time to obtain a Government report, you can make a fairly efficient test yourself by counting out 100 grains, placing them between wet flannel or blotting paper on a dinner plate and covering them with another one. This should be kept moist and in a room where the temperature will be about 60 degrees Fahr. This is about the temperature of an ordinary cool living room. At the end of five days count and remove the grains that have sprouted, noting result, and repeat this at the tenth day. You will thus have a fairly accurate indication of the percentage of good seed in your sample.

Grain suitable for seed should test 90 per cent., and when seed of less quality is used a greater quantity must be sown per acre. Grain cut on

the green side, as is frequently done to utilize the straw, is generally worthless for seed.

Clean Seed.—The “Noxious Weed Act” of the Province provides heavy fines for any person selling seed grain containing seeds of noxious weeds. Sow only clean seed and re-clean the cleanest before sowing. You cannot afford to grow weeds on your land, you need it all for the production of merchantable crops.

Every 100 lbs. of dry matter grown as weeds uses up sufficient moisture to produce 50 lbs. of grain.

For this reason extra effort should be made to prevent the introduction of troublesome weeds upon the clean farm land.

The best investment a farmer can make is undoubtedly an up-to-date fanning mill. Thousands of farms have been seeded down with weeds to such an extent that they have become almost unprofitable to work, simply through failure on the part of the farmer to clean his seed before putting it in the ground.

So far as possible, grain for seeding purposes should be purchased or arranged for early in the season in order to secure it at most favorable rates and also to get the proper quality. If delayed too long, the better grain is liable to be shipped out of the country.

TREATMENT FOR SMUT.

There are several diseases of grain which are commonly known as smut.

Smut is recognized by the transformation of some part of the plant into a mass of very small dark colored bodies known as spores. The stinking, or covered smut of wheat and barley, and the loose smut of oats, are by far the most destructive. Wheat smut will not affect or grow in oats and barley, neither will the oat or barley smut affect wheat.

It only takes a very few heads in each acre of grain to infect the whole crop, as the spores, or particles of smut, are fine like dust, and are easily blown from plant to plant, and from field to field by the wind.

Statistics show that sowing untreated smutty wheat lessens the yield from one to twelve bushels per acre, and gives a poor quality of wheat.

THE REMEDY.

The remedy for this evil is prevention. Stinking smut of wheat can be entirely prevented by a treatment of the seed grain before sowing, so as to kill the smut spores (seed of the smut plant). This can be done without injury to the germination qualities of the seed grain. The best farmers in Southern Alberta invariably treat winter and spring wheat, oats and barley against smut, as a precautionary measure.

The treatment is very simple and inexpensive. Either formaldehyde (usually called formalin), or bluestone (copper sulphate) may be used. Some claim that bluestone is best for the treatment of wheat, and that formalin is best used for oats and barley. However, either one, when properly used, will destroy smut spores on any grain.

HOW TO APPLY THE FORMALIN.

There are a number of practical methods by which formalin may be applied to the grain. One simple method is to spread the grain out on the

granary floor or in a wagon box to a depth of two to four inches, then sprinkle the mixture upon the grain with a watering can, mixing thoroughly so that the formalin has free access to all parts of the kernel. The grain may then be gathered up into a pile and covered with damp sacks so as to retain the fumes of the formalin. This is quite important. Another practical method is to provide an ordinary barrel and a wooden trough, the latter sufficiently wide to hold a sack of grain, and long enough to hold several sacks; this trough to be so supported so as to drain back into the barrel. Place the formalin mixture in the barrel and dip the whole sack of grain into it. The sack is allowed to remain in the formalin for three minutes and is then removed to the trough and allowed to drip.

HOW MUCH FORMALIN IS REQUIRED.

Use 16 oz. or 1 pound of 40 per cent. formaldehyde to 35 to 40 gallons of water. This will be sufficient to treat 60 to 70 bushels of seed.

HOW TO APPLY BLUESTONE.

Dissolve one and a half pounds of bluestone (copper sulphate) in hot water and add water to the extent of 50 or 60 gallons. The solution may be placed in a coal oil barrel and the wheat dipped, as with formalin, or the wheat may be placed on the granary floor and merely sprinkled and mixed, turning it over with a shovel so that it is all thoroughly dampened.

WHEN TO TREAT.

Treatment of grain should not be done until shortly before the grain is to be sown. The grain should be given sufficient time to partially dry, so as not to in any way interfere with the sowing with the drill. A common practice is to treat in the evening sufficient for the next morning's seeding, and leave covered up with the sacks over night. Others keep someone treating grain continually, and not more than enough ahead to keep the drills going.

Perhaps one precaution might be observed, and that would be not to pile the grain up after treating, either for too long, or in too deep piles, as there is danger of heating.

WEEDS.

A few remarks have already been made in regard to the importance of not using seed grain containing seeds of noxious weeds. Owing to the unparalleled fertility of Southern Alberta lands, it is marvellous how quickly weeds obtain a foothold and how difficult it is to thoroughly eradicate them without continuous summer-fallowing and hand picking. It is, therefore, of the utmost importance that every settler should be able to identify weeds that are likely to give him trouble in order that he may take steps to get rid of unwelcome guests of that sort before they have an opportunity of over-running his farm. The Company has made arrangements with the Provincial Department of Agriculture for supplying each colonist on the Company's lands with a copy of a bulletin dealing specifically with the question of weeds, and containing illustrations of those that are liable to become troublesome. This can be obtained by application to the Company's

Offices at Calgary, and should be in the hands of every settler before he starts operations on his land.

GOPHERS.

It is quite the custom to find on the open prairie a large number of gophers, and although they are a very inquisitive animal, and will lend themselves to almost any decoy, the use of water for the purpose of their destruction will for several reasons more than pay for its cost. Irrigation has been found to be the most satisfactory way of destroying them. On the non-irrigated land they are, however, liable to be troublesome, and may also commit damage on adjoining irrigated land, particularly on alfalfa meadows. It is, therefore, a public duty resting on the shoulders of every settler to destroy gophers on his own lands, and in some cases even on adjoining unoccupied lands.

While on this subject it might be mentioned that hawks are of the greatest possible assistance in keeping down gophers, and they should not, therefore, be shot. Only a very few of the varieties of hawks prevalent in Southern Alberta interfere with the farm fowls, and the loss from that source is a mere trifle.

An easy way of destroying gophers is by means of poisoned grain. Take three-quarters of an ounce of strychnine sulphate and dissolve it in a pint of hot water; add one pint of molasses and a teaspoonful of oil of anise. Thoroughly heat and mix the liquid. While hot pour it over half a bushel of clean wheat and mix in a tight vessel. Put in a little wet flour to take up the moisture and make the poison adhere to the grain. Let it stand over night, and the following morning arm your wife and children or friends with a sufficient quantity of the poisoned grain in old tins of some sort and simply walk all over the farm, and, if necessary, outside of the farm, and place a few grains inside every gopher hole. This should be done before the grass becomes green, as once there is good pasture available, the gophers will frequently leave the grain untouched. Poisoning as indicated is the only effective way of getting rid of gophers.

POSSIBILITIES OF THE SMALL FARM.

It has been pointed out elsewhere that the Canadian Pacific Railway Company is only interested incidentally in the sale of land. A purely land selling concern, having selfish interests at stake, would show a decided preference for large farms, as this would mean the sale of a greater number of acres of land to each individual. This Company, however, does not view the matter from this standpoint. Its sole desire is, that each settler on the Irrigation Block should possess a farm of whatever dimensions will ensure the greatest possible profit to the owner, having in view his capital, ability as a manager and other conditions that enter into successful farming.

Generally speaking, there is room in Western Canada for the large farm as well as the small farm. The home of the large farm, however, is not in an irrigated district unless very large capital and a high degree of managing skill are available. There are mammoth farms in Southern Alberta located

in districts of scanty rainfall, depending upon the entire preservation of the rainfall by proper culture. Mechanical motive power is introduced on these farms, and everything is done on a large scale and at small expense per acre of crop. Such farms are usually devoted to the production of one crop, principally wheat. This system of agriculture is "wheat manufacturing" rather than "farming."

There is, however, a wide difference between "bonanza" farming and the proper culture and development of an irrigated area. The methods that may be profitable in the one case will not, in any shape or form, apply in the other. If history and past experience count for anything, the irrigated farm means essentially a small farm. Latitude and altitude have something to do with the average size of such farms. In the South Westerly portions of North America where the summer season is long, the weather hot and the water supply plentiful and where markets exist for every conceivable kind of tender garden truck, families make a good living on from five to ten acres of irrigated land specialising on some one crop. Going further north where hardier fruits are made a specialty, farms may vary up to twenty acres each. In the great alfalfa producing areas of Colorado, Idaho and Montana, forty to sixty acres of good irrigated land is generally considered a fair size farm.

In laying out their farms in the Yellowstone Valley of Montana, the Reclamation Service of the United States decreed that no farm should be larger than forty acres. To many people a farm of forty acres seems to be absurd, but there are settlers on those very farms who are making annually (representing return for their labor) as high as \$2000. Of course, this means an intensified system of cultivation, and where this is the case almost definite returns may be relied upon.

In the Canadian Pacific Irrigation Block, we could scarcely, owing to the more recent development of the country, recommend forty acres as a standard farm unit, but it is considered that eighty acres of fair irrigable land should be ample to employ the time and capital of the average man. In fact, it is considered, that unless the family is very large and the available capital greater than the average, that any area over eighty acres of fair irrigable lands cannot be profitably handled. Under the circumstances, the Company has no hesitation in advising settlers on the Irrigation Block to carefully study the question of the small farm and its possibilities. There is always a good demand for land in the Irrigation Block and any person who owns more irrigable lands than he can profitably handle may easily dispose of the surplus to others. The Company places every facility in the way of such transactions.

AN EIGHTY ACRE FARM PROGRAMME.

Let us look at the possibilities of an 80-acre irrigated farm in the Bow Valley when handled in an intelligent and thoroughly practical manner.

Buildings and Equipment.—These on the start should be erected according to the pocket book of the owner, and might vary from a very few hundred dollars put into a "shack" and stock shed, to as many thousands for more expensive house and barns.

With regard to the amount to put into buildings, we will only say build well within your means, for it is much easier to add to your buildings as your crops will allow, than it is to meet your obligations when you have spent beyond your pocket book.

The following machinery and equipment is required for an eighty acre farm: 1 team, 1200 to 1400 lbs. in weight; 1 set harness; 1 wagon; 1 set harrows; 1 set of discs; 1 walking plow; 1 sulky plow; 1 6-foot binder; 1 scuffler for roots, potatoes, etc.; 1 mower; 1 hay rake; small tools and incidentals.

All of this equipment would not be required right on the start, and should only be purchased when absolutely required. There is also the possibility of buying such things as binder, mower, hay rake, etc., co-operatively with your neighbor. This very materially reduces the cost of machinery on the start, and is highly recommended.

Fencing.—This may be delayed until the land is broken and seeded, but should be in place as soon as the crop appears. Three strand barb wire with posts set one rod apart, will cost about \$130.00 per mile. Woven wire fences are much more attractive, but, of course, cost a little more.

Reserve one acre for buildings and yards. We would then fence off 20 acres of the prairie grass, which could be irrigated readily for pasture. This will pasture about six dairy cows for the summer. The milk, cream or butter from these cows ought to bring in about \$240 during the first year, aside from what would be used upon the table.

Beginning about April 15th, we would break up as much sod as we could thoroughly work up into shape by May the 17th or 18th. Break to a depth of 5 to 6 inches so as to get earth enough to work into a seed bed, and seed to flax at 30 lbs. to the acre. The breaking would require the hiring of an additional team of horses. By May 18th we should have about 32 acres in splendid tilth. If the spring is especially dry, the irrigation of the breaking might begin May 1st. Ten to twelve days should add sufficient moisture so that the final working up of the breaking for the flax would result in an excellent seed bed. Seed the flax by May 20th or 21st. This 30 acres of flax should return 10 bushels to the acre at least, which at \$2.00 per bushel would bring in \$600.00.

Two acres of this thoroughly prepared breaking should be reserved for vegetables and potatoes, which would provide all the necessary vegetables for the year, together with sufficient seed for the next spring.

Potatoes, vegetables, etc., may be planted soon after the 1st of May.

A small paddock, 4 to 6 rods square, might also be seeded with rape (4 lbs. per acre) for pasture for a hog or two.

After the flax, vegetables and potatoes are sown, then the balance of the land (27 acres) may be irrigated for further breaking and cultivation. The breaking should follow up as soon as possible after the irrigation, and the packing and discing as soon as possible after the breaking. This will consume most of the time up to the middle of July. For the balance of July get the haying equipment ready, and from time to time, as needed, harrow the last 27 acres broken.

During August hire yourself and team out to some of your neighbors to help to put up their hay. Take your time in hay for winter feeding.

About August 25th seed down ten acres of your last breaking to fall rye for early spring pasture, at the rate of about 2 bushels per acre.

During September and October care for your own harvest of flax, potatoes and vegetables.

Thus the first year will appear somewhat as follows:

Total Cost of Operation First Year.

15 bushels of flax seed at \$3.00	\$ 45.00
Hiring team to assist in breaking, 30 days at \$4.00	120.00
10 bushels of seed potatoes at \$1.25	12.50
Feed for horses (likely have to purchase first year) 12 tons at \$10.00..	120.00
400 bushels of oats at 40c	160.00
2 young pigs at \$5.00 each	10.00
20 bushels of fall rye for pasture at \$1.50	30.00
3½ tons of hay each for six cows at \$10.00	210.00
Living expenses for family of five (man, wife and three children) first year, at \$25.00 per month (garden vegetables not included) ..	300.00
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	\$1007.50

Income for first year:—

6 cows at \$40.00 each	\$240.00
30 acres flax at 10 bushels per acre, sold at \$2.00	600.00
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	\$840.00

The operating expenses the first year will scarcely be covered by income, and in fact it would be folly to expect it.

It will also be understood that the above figures do not include buildings and fences, nor chattels, such as horses, cows, machinery, etc., as they are capital charges, and must not be charged to operation.

The Second Year.

Our farm appears as follows the second spring:

1 acre, buildings.

20 acres prairie.

30 acres flax stubble.

2 acres on which were vegetables.

10 acres in rye pasture.

17 acres fallow.

Our first consideration will be to provide hay and oats sufficient for the stock carried, viz.: 2 horses, 6 cows, 2 pigs and 50 chickens.

Table of Requirements for Various Stock.

Hay	Oats	Barley	Peas	Wheat
2 horses 12 tons oat hay.	550 bu.	.....	.....	.....
6 cows 21 tons oat hay.	195 bu.	135 bu.	.....	.....
2 pigs	10 bu.	16 bu.	10 bu.	.....
50 chickens .....	.....	.....	.....	30 bu.

Note 1.—The chickens will be fed principally upon the screenings from all the other grain.

Note 2.—The pigs will require a small paddock of 4 to 6 square rods seeded to rape for summer pasture.

The hay and grain as represented in the above table will require:

For oat hay	20 aercs
Oats	10 acres
Barley	4 acres
Wheat and Peas	1 acre
35 acres	

This with the one acre for buildings will occupy 36 aercs. With a single discing the 17 acres of late breaking will likely be in fit shape for crop. The 30 aercs flax stubble, and two acres garden, may be plowed. This will give us 49 acres, to be seeded as follows: 20 acres oat hay; 10 acres oats; 4 acres barley; 1 acre wheat and peas and 1 acre buildings, leaving 13 acres. Five of the remaining 13 shall be seeded to potatoes, and the balance, or 8 acres, to be seeded to wheat.

The 20 acres of prairie should be broken early enough for flax, and seeded as mentioned before.

Thus our operating expenses for second year will be as follows:

For Feed for Stock.

Seed for 20 aercs oat hay, 2½ bushels per acre, at 40c	\$20.00
Seed for 10 acres of oats, 2½ bushels per acre, at 40c.	10.00
Seed for 4 acres barley, 2 bushels per acre, at 60c.	4.80
Seed for 1 acre of peas, 2 bushels per acre, at \$2.00	4.00
Seed for 1 acre vegetables	10.00
Seed for 10 aercs of fall rye, 20 bushels at \$1.50	30.00
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Total	\$78.80

Operating Expenses for Cash Crop.

Seed for 5 acres potatoes, 10 bushels per acre, at \$1.00	\$50.00
Seed for 8 aercs wheat, 1½ bushels per acre, at \$1.00	12.00
Hiring extra team 10 days breaking, 20 acres prairie	40.00
Seed for 20 acres flax at ½ bushel per acre, at \$2.50	25.00

Total operation charges	\$205.80
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To this add \$300 for living expenses (outside garden produce)	\$300.00
Wear and tear on machinery	50.00
Other unexpected expenses	34.20
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	\$590.00

Cash Revenue Second Year.

4½ acres potatoes (balance saved for seed)	\$540.00
8 acres of wheat at 25 bushels at 60c. per bushel	120.00
20 acres flax at 10 bushels, sold at \$2.00	400.00
6 cows at \$40 each	240.00
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Total cash	\$1300.00
Total cash income	\$1300.00
Operating and living expenses	590.00
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Clear gain second year	\$740.00

Get all the plowing possible done in the fall, and seed down another ten acres to fall rye pasture. For this we will take 10 acres from our early cut oat hay ground.

The Third Year.

Our farm appears as follows the third year:

20 acres oat stubble.
 4 acres barley stubble.
 1 acre pea stubble.
 5 acres potato ground.
 8 acres wheat stubble.
 20 acres flax stubble.
 10 acres fall rye pasture ground.
 1 acre garden.
 1 acre buildings.
 10 acres freshly sown fall rye for pasture.
 —
 80 acres.

Again the third year our first consideration must be for feed for 2 horses, 6 cows, 4 pigs, 50 hens. This will require practically the same amount of feed and expense as during the second year, which, as we have seen, will occupy 35 acres. The only difference in stock is in the addition of two hogs as we wish to produce a considerable amount of pork the fourth year. Thus we have for cropping the third year 44 acres after eliminating 1 acre for building site. We must now relieve ourselves from the necessity of sowing fall rye every year for pasture by seeding 13 acres for permanent pasture.

The following grass mixture will be found to be good and may be seeded at about the following rate per acre: Orchard grass, 4 lbs.; timothy, 3 lbs.; alfalfa, 4 lbs.; common red top, 2 lbs.; alsike, 2 lbs.; meadow fescue, 4 lbs.; and western rye grass, 2 lbs. Total, 21 lbs. per acre. In addition to this we

might also seed down 13 acres to alfalfa for the next year. Seed at the rate of about 17 lbs. to the acre. This will leave us 18 acres to be seeded as follows:

10 acres potatoes
8 acres wheat

By comparing with the foregoing table, it will be seen that the operating expense for seeding the potatoes and wheat will be approximately \$112.00. By adding to this the maintenance expense, together with other extras we have:

Operation expense of stock feed	\$ 48.80
Operation expense of cash crop	112.00
Seeding down 13 acres alfalfa	72.30
Household expense (as before)	300.00
Wear and tear on machinery	50.00
Other incidental expenses	66.90

	\$650.00

Total Cash Revenue.

9½ acres potatoes (½ acre reserved for seed)	\$1140.00
8 acres wheat	120.00
6 cows at \$40.00	240.00

Total income	\$1500.00
Total expense	650.00

Profit third year	\$ 850.00

In the fall of the third year all the plowing possible should be done. There will be no need to seed to fall rye again as we have thirteen acres of permanent pasture, and in addition, 13 acres of alfalfa for hay.

The fourth year we have land as follows:

13 acres permanent pasture.

13 alfalfa.

10 potato ground.

3 wheat stubble.

30 acres oat stubble.

4 acres barley stubble.

1 acre garden.

1 acre buildings.

—
80 acres.

The Fourth Year.

Our whole endeavor so far has been to make as large a revenue as possible, and at the same time work the raw prairie sod, with which we started, round to the point where we may begin a well organized system of crop rotation.

For the fourth year we should have 3 to 4 sows, either of our own raising or purchased, so that we might raise something like 20 to 30 pigs the fourth year. Our crop rotation will now admit of this, and we could also add about two more cows. We will have done wisely if we have retained a few of the heifer calves dropped from our best milk cows.

For the fourth year we could handle our land about as follows:

2 acres for house, barn, yards, etc. This would leave 78 acres which we could divide into six 13-acre fields. One of these we have seeded to permanent pasture and one to alfalfa during the third year. This leaves us four 13-acre fields to be used for the production of the farm crops. It is proposed to carry on this farm 2 horses, 8 cows, 20 hogs and 50 hens. The four 13-acre fields, together with the 13 acre alfalfa field, might be very profitably used in the following rotation:—

1st Field	2nd Field	3rd Field	4th Field	5th Field
1912 Alfalfa....	Oats	Garden, roots and peas.....	Wheat	Barley
1913 "	Garden, roots and peas.....	Wheat	Barley	Oats
1914 "	Wheat	Barley	Oats	Garden, roots and peas.....
1915 "	Barley	Oats	Garden, roots and peas	Wheat
1916 "	Seed to Alfalfa.	Garden, roots and peas.....	Wheat	Barley
1917 Garden roots and peas	Alfalfa	Wheat	Barley	Oats

RETURN FROM 80 ACRES.

13 acres oats at 80 bushels	1040 bushels
13 acres garden—4 acres potatoes	800 "
1 acre roots	300 "
1 acre strawberries, currants, vegetables	
7 acres peas at 40 bushels	280 "
13 acres wheat at 30 bushels	390 "
13 acres barley at 40 bushels	520 "
13 acres alfalfa at 4 tons	52 tons
13 acres permanent pasture for cows and horses for five months.	

FEED REQUIRED FOR FARM STOCK.

- 2 horses need 6 tons alfalfa each, or 12 tons per year.
- 8 cows need $3\frac{1}{2}$ tons alfalfa each, or 28 tons per year.
- 2 horses need 350 bushels of oats per year.
- 8 cows need 255 bushels of oats per year.
- 8 cows need 185 bushels of barley per year.
- 20 hogs need 225 bushels of oats per year.

20 hogs need 160 bushels barley per year.
 20 hogs need 50 bushels peas per year.
 50 hens need 12 bushels of wheat per year.
 50 " " 20 bushels of oats per year.
 50 " " 1 ton of alfalfa per year.
 50 " " 15 bushels of barley per year.
 50 " " screenings from all other grain.

GRAIN REQUIRED FOR SEED.

39 bushels of oats	26 bushels barley
26 bushels of wheat	26 bushels peas
	40 bushels potatoes

CROPS LEFT TO SELL AFTER DEDUCTING NECESSARY FEED USED FOR STOCK ON FARM AND SEEDING PURPOSES.

Alfalfa, 50 tons—

Use for horses	13 tons
Use for cows	28 tons
Use for hogs	2 tons
Use for poultry	1 ton
	—
	44 tons

Balance to sell, 8 tons at \$10.00 \$80.00

1040 bushels of oats—

Use for horses	530 bushels
Use for cows	255 bushels
Use for hogs	200 bushels
Use for poultry	20 bushels
Use for seed	39 bushels
	—
	1044 bushels

Practically balances production.

520 bushels of barley—

Use for cows	185 bushels
Use for hogs	160 bushels
Use for poultry	15 bushels
Use for seed	26 bushels
	—
	386 bushels

Balance to sell, 134 bushels at 45c. \$60.30

390 bushels of wheat—

Use for poultry	12 bushels
Use for seed	26 bushels
	—
	38 bushels

Balance to sell, 352 bushels at 60c. \$211.20

280 bushels of peas—		
Use for hogs	50 bushels	
Use for seed	26 bushels	
	—	
		76 bushels
Balance to sell, say 200 bushels at \$1.00	\$200.00	
800 bushels of potatoes—		
Table use	15 bushels	
Seed	40 bushels	
	—	
		55 bushels
Balance to sell, 745 bushels at 80c.	\$596.00	

CLEAR INCOME FROM 80 ACRES.

8 cows at \$40.00 each	\$320.00
50 hens lay 300 dozen at 25c	75.00
134 bushels barley at 45c.	60.30
200 bushels of peas at \$1.00	200.00
352 bushels of wheat at 60c.	211.20
8 tons of alfalfa at \$10.00	80.00
20 hogs at \$12.00	240.00
745 bushels potatoes at 80c.	596.00
	—
	\$1782.50

Roughly speaking \$1700.00. Let us deduct for incidental expenses that may occur a further \$200.00. This will give us an income that will represent the individual's work for the year of \$1500.00.

SUMMARY.

In giving the foregoing we have tried to be as conservative as possible. It will be noted that in charging up all seed grain, etc., for operation purposes, we have charged it at top prices, while in arriving at the revenue, the ordinary market prices prevail. There is another point that must be born in mind and that is that the foregoing plan for the operation of an 80-acre farm is for the man who is handling it along general lines. There are many special lines that might be followed, which would necessitate the alteration of the foregoing plans somewhat. For instance, a farmer might wish to specialize in Dairying, or Poultry Keeping, or Vegetable Gardening, or in the production of pure strains of Seed Grain. Any one of these lines might be followed so as to increase very materially the revenue as given year by year above. In thus following the special, and more profitable lines the plans for cropping would have to be modified to suit the necessities in the case.

The demand for good horses in Alberta far exceeds the supply, so that the settler would do well to purchase good brood mares. In this way alone the revenue might be increased each year to the extent of from \$150.00 to \$250.00.

It is a well known fact that the greatest returns come from the specially conducted lines and for this reason we would recommend that each settler should select some special line of endeavor, that he shall depend upon for his main revenue, and then that he should arrange round that a well organized system of agriculture. If this is done the revenue given above may be increased very materially. However, it was not the purpose in this "Settler's Guide" to give maximum returns, but rather a fair average revenue when an eighty acre tract of land is handled in an intelligent manner.



PART VI.

IRRIGATION

The general agricultural practice throughout the Western States and the Prairie Provinces of Canada is tending more and more towards confining crop production to summer-fallowed lands. The introduction of the summer-fallowed principle has absolutely revolutionized farming operations in the sub-humid belt of Western America, where the average annual rainfall is below 20 inches. The greater part of Western America, including the prairie provinces of Canada belongs to this sub-humid belt. The chief object is simply to store in the soil two seasons' rainfall for the purpose of producing each crop. For this purpose periodical surface cultivation is practiced. With an abundant supply of moisture available by artificial means, however, the main object of summer-fallowing largely disappears. It, therefore, follows that summer-fallowing will be eliminated on irrigated lands, thus leaving the whole crop areas available for production each year, instead of only one-half of it. This is the outstanding feature of the irrigated farm.

OPERATION ORGANIZATION.

The Company has devoted a great deal of time and consideration to providing an operation and maintenance organization that will be able to cope successfully with the situation. Permanent and extensive central headquarters is provided at Strathmore and the field service will be placed in the hands of a Superintendent of Operation and Maintenance. For this position the Company has selected an expert in irrigation operation who has had many years' experience and possesses all the necessary technical qualifications. A competent Assistant Superintendent has also been appointed. Under these officials will be a number of Canal Superintendents, whose time, however, will be principally occupied with engineering problems and construction.

The actual delivery will be in the hands of a corps of officials termed "Water Masters." The Western Section will be divided into a number of divisions, each in charge of a water master. This officer will be held responsible for water delivery within his district, and will also be available to lay out the farm systems. Acting as irrigation instructor, he will advise the water consumers in regard to the application of water. These employees will be practical irrigation farmers, with experience in operation and maintenance, as well as in agricultural matters.

Each water master's division will be divided into a sufficient number of "Ditch Rider's" districts. The ditch rider will deal directly with the water consumer, and will report to the water master.

IRRIGATION AND DRAINAGE.

Good drainage is essential for permanent productive irrigated farming. It is recognized to be a practical impossibility to supply just a sufficient quantity of water, and no more, for the production of crops, and it is, therefore, necessary that means should be adopted for draining off the superfluous quantity of moisture. Unless this can be done, it will have a tendency to raise the level of the ground water until it comes to the surface, where it will cause an accumulation of alkali and will drown out the crops. Too much stress cannot be laid on the absolute necessity of good drainage for the irrigated field.

Easily irrigated soils will absorb sufficient water in 24 hours to become moist to a depth of two to three feet. Much depends of course, upon the

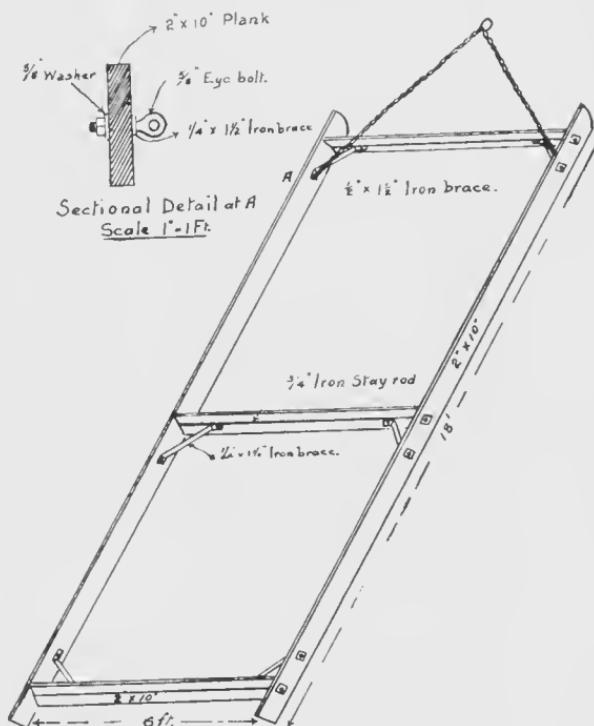


Fig 2 - Plank Leveller

sub-soil conditions. Where land is underlaid with sand, gravel or even a sandy or a porous clay, a greater quantity of water may be applied with impunity than where the sub-soil is impervious.

LEVELING THE LAND.

Much of the land in the western section should be graded and smoothed before it can be irrigated with the greatest economy and most satisfactory

results. For easy irrigation land should have even slopes from the ridges or elevations carrying the head ditches. Where lumps and depressions of some size occur it is usually best to begin grading operations, after plowing in the usual manner, by using a fresno scraper and four horses. With this instrument the knolls can be rapidly cut down and deposited in a layer at the desired point. After this preliminary work the smaller irregularities are smoothed by dragging over the field a leveler, 16 to 20 feet long, and 5 to 6 feet wide. The leveler is made of planks as shown by Fig. 2, and usually requires four horses.

IRRIGATION INSTRUCTION.

There are many farmers on the Irrigation Block who are unfamiliar with irrigation as an aid to the production of crops. Experience has shown that

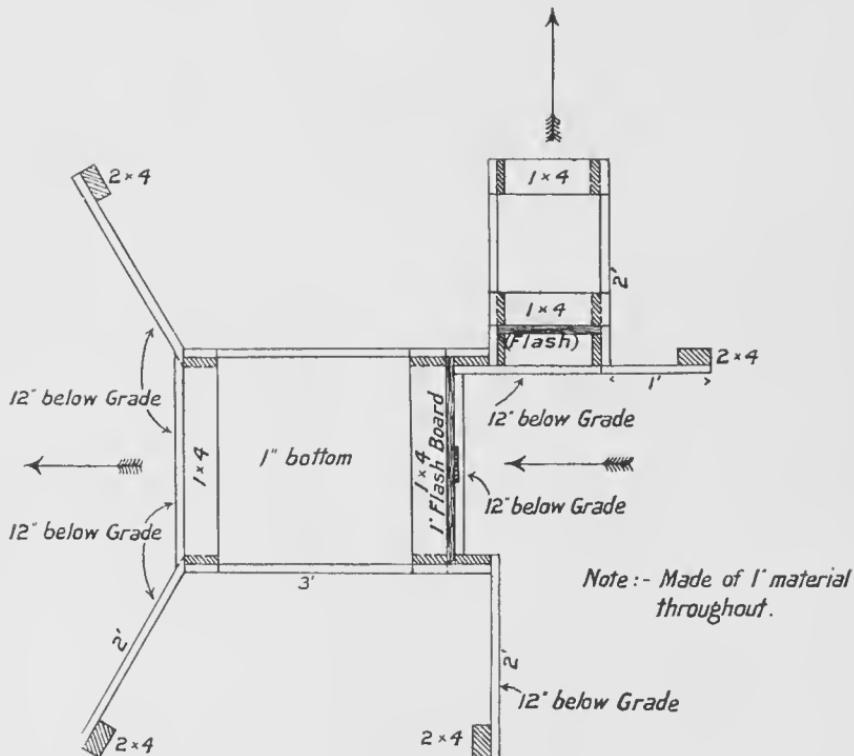


Fig. 8 - Farm Gates.

the application of water to crops in this country is very beneficial in all years, and necessary in dry years, besides it is observed that the use of water enables the farmer to produce a more diversified crop and it is easier to secure a proper rotation for keeping up the fertility of the soil. It, therefore, follows that each settler should construct his field ditches, and

use water as required. The employees of the Company in the Operation and Maintenance Department are instructed to give all the aid and information they can to settlers asking for help along these lines. The Water Master in each district is particularly well qualified to instruct as to effective methods of handling water in the fields, and will be available for consultation whenever it will not interfere with his duties in delivering the water. Where the farmer is forced by the lay of the land to build ditches in cut or fill he can generally get them staked out by the Company forces at a mutually agreed upon date. The head ditches should, if possible, be constructed in the fall, and the field laterals for a grain crop before the grain gets very much of a start.

FARM DELIVERIES.

The headgate that controls the flow of water from the Company's supply ditch to each farm is constructed by the Company at the expense of the farmer, and is absolutely under the control of the Company.

In addition to this structure it becomes necessary for the farmer to have at various points along his main distributary similar gates, but not necessarily on as large a scale to control the water supply of his system of laterals. Fig. 8 illustrates the manner of constructing these farm gates economically and efficiently.

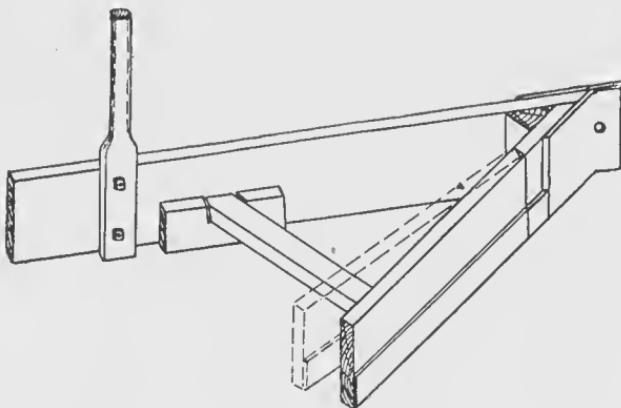


Fig. 3-Adjustable 'V' Scraper or Crowder.

FARM DITCHES.

The Company undertakes to deliver the water at the farm boundary, and the settler will himself provide for the distribution within the boundaries of his holding. These ditches can be readily constructed by the farmer himself. The first step necessary is to ascertain the location of the main distributaries. The Company maintains an engineering staff that will be available to lay out a proper distributary system on every irrigated farm within the Block.

Applications for the services of an engineer for that purpose should be made at the various engineering headquarters within the Block. When the location of the ditch has been made on the ground, the surface, if on unbroken land, should be broken and the sods removed by hand and piled up



Fig. 4 - Farm Ditch No. 1

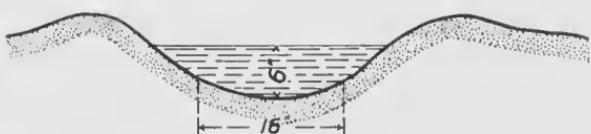


Fig. 5 - Farm Ditch No. 2

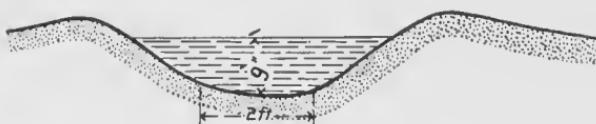


Fig. 6 - Farm Ditch No. 3



Fig. 7 - Section of small raised ditch.

Fig. 4, 5, 6, 7—Different Styles of Ditches.

along the edges of the ditch as directed by the engineer. The ground below may then be plowed and a team hitched to a home-made "V" scraper or crowder constructed as indicated in Figure 3.

This implement will remove the loose soil and pile it on both sides of the ditch. Figures 4, 5, 6 and 7 illustrate the manner of constructing the various styles of ditches. Where the grades are flat it will be advisable to

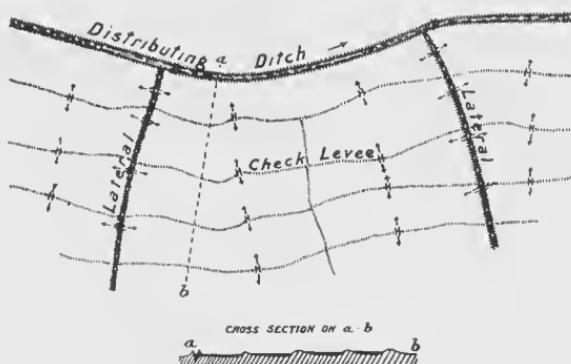


Fig. 11-Irrigation by system of check levees.

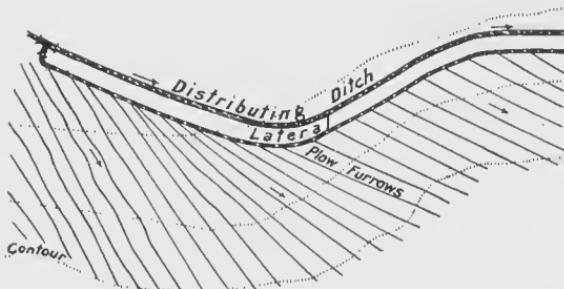


Fig. 12-Furrow Irrigation.



Fig. 13-Canvas dam and water turned from furrow by same.

build the ditches a little larger than shown in the drawings. Where considerable cuts or fills are required, a drag scraper may be desirable for the work.

METHODS OF LAYING OUT FARM DISTRIBUTARIES.

Figures 9, 10, 11, 12 and 13 illustrate various methods of distributing the water on the land.

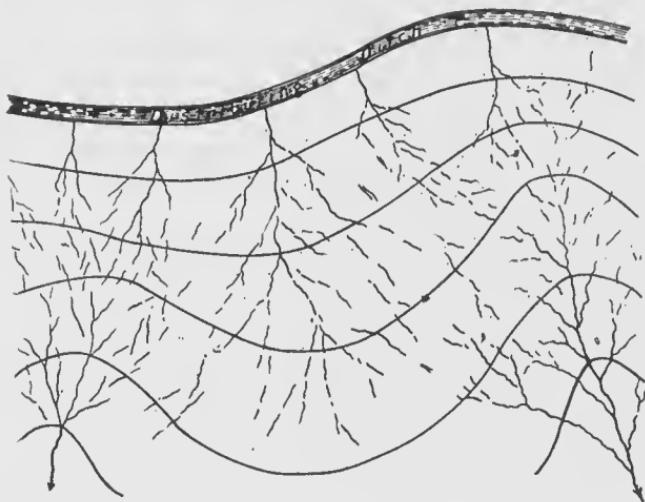


Fig. 9 - Wild Flooding.

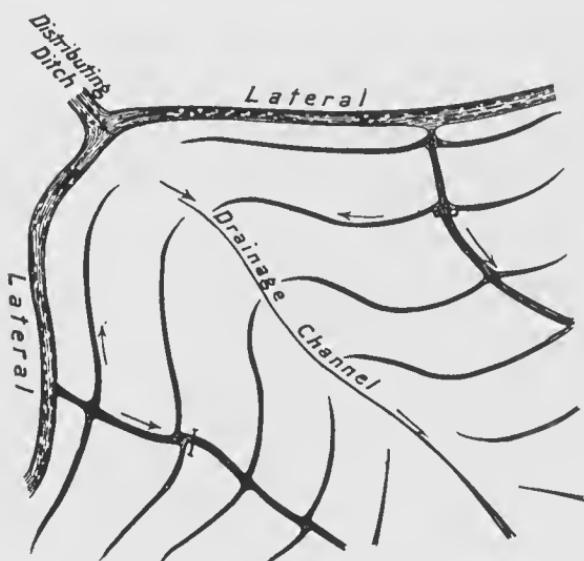


Fig. 10 - Distribution on rolling land

Figure 14 shows a furrower, which may be easily and cheaply made by the farmer himself.

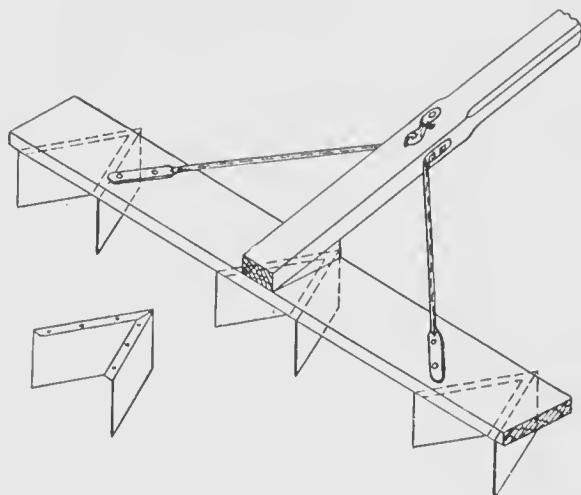
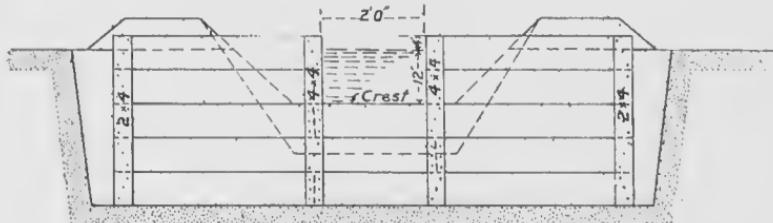
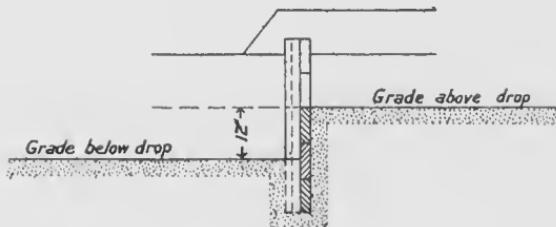


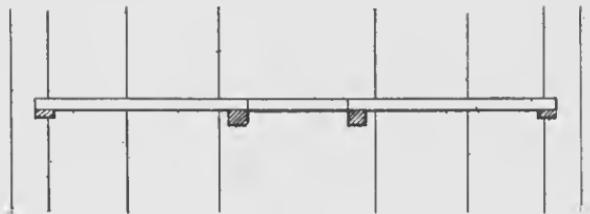
Fig. 14 - Furrower



Elevation, Down Stream.



Longitudinal Section



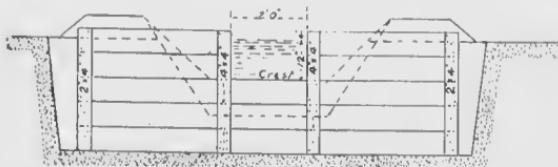
Plan

Fig. 15- Check or Drop .

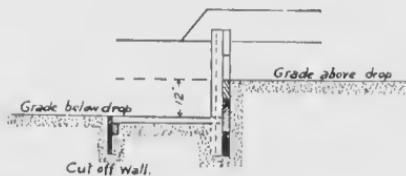
DROPS IN DITCHES.

It happens sometimes that in the construction of ditches it is necessary to run the water down a slope that would be very seriously affected by the force of the water if allowed to run naturally. In such cases, what are termed checks or drops may be constructed, which lower the water at different points so that no evil results follow.

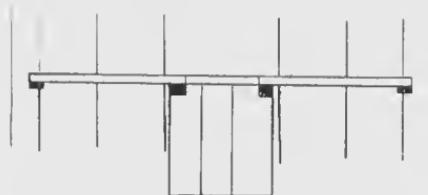
Fig. 15 will show a very practical form of check or drop.



Elevation, Down Stream.



Longitudinal Section



Plan.

Fig. 15 - Check or Drop.

FARM CULVERTS OR BRIDGES.

It frequently happens that it will be found necessary to introduce a few culverts, or small plank bridges, over the various ditches on the farm for convenience in farm operation.

The matter should in all cases be taken up with the Operation and Maintenance Department before such crossings are constructed.

Fig. 19 shows a section through a culvert constructed by plank, and having wings to the upper end.

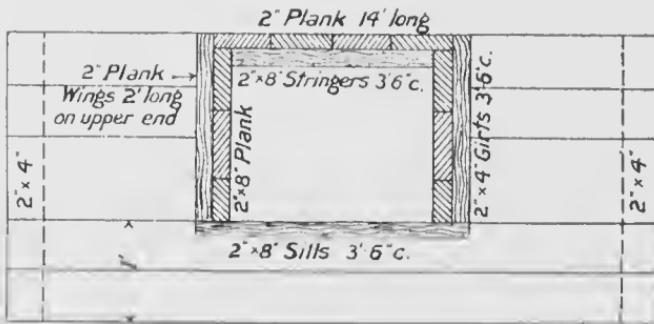


Fig. 19 - Box Culvert.

These wooden culverts are, however, being rapidly superseded by circular galvanized iron culverts, which are strong and very durable.

FLUMES.

Flumes are constructed from one high point of land to another high point, or, in other words, are structures for carrying water over ravines or low depressions. Figure 19 shows one constructed entirely of wood. Wooden structures, however, are liable to shrink in dry weather, or during periods when no water is flowing. A new corrugated galvanized iron trough is being used for the conveyance of water, which will be much more durable and which will give much better satisfaction. However, metal flumes will cost more than frame structures.

ADMINISTRATION OF WATER.

The duty of water is fixed by the Dominion Government, and the Company is compelled to furnish whatever quantity of water per acre the Government directs. The "duty" as at present fixed, is one cubic foot per second, continuous flow during the irrigating season, for each 150 acres. The Dominion Irrigation Act, under which water is supplied in Alberta, provides that a continuous flow of water shall be furnished during the irrigating season. It is, however, found that a small stream cannot be so profitably handled, and it is, therefore, desirable for any three or four consumers on the same supply lateral to pool their water supply and each use

the entire flow for the combined acreage they control for a limited time periodically. The Company will lend every assistance in carrying out such mutual arrangements.

Requests for the delivery of water should be mailed to the Strathmore office, or handed to the Ditchrider, or Watermaster, so that these cards will be received at the Strathmore office 48 hours in advance of the time of delivery of water, or 24 hours in advance of the stopping of the delivery of water. Where mail boxes are provided along the canal banks, the requests for delivery of water may be deposited therein and collected by the Ditchrider if an understanding has previously been arrived at between the consumer and Ditchrider.

It might here be mentioned that the gate in the Company's ditch supplying each farm is absolutely under the control of the Company, and individuals are strictly prohibited from opening or shutting this gate. The Dominion Irrigation Act and the Criminal Code provide penalties and imprisonment for tampering in any way with these gates.

WASTE OF WATER.

The subject of the use of water for irrigation cannot be dismissed without a few words in regard to the **abuse** of water. It is safe to say that more harm than good has been done by inexperienced farmers, who would not listen to advice, and used water injudiciously. The fact should never be lost sight of, that there is no royal road to success in any system of farming. Cultivation and soil condition comes first; moisture supply comes only second. It is very tempting to put the seed in the ground, perhaps badly prepared, and trust to irrigation to do the rest. Irrigation never can take the place of cultivation. The two must go hand in hand.

In newly irrigated sections, the sight frequently meets the eye of road allowances and natural depressions being filled with waste water, meadows water-logged and made unproductive, and various other forms of destruction caused entirely by the too liberal or indiscriminate application of water. Thousands of acres have been water logged and rendered unproductive in the best irrigated districts through wanton carelessness and by men who were supposed to understand irrigation.

Under the climatic conditions of Southern Alberta, no greater boon could be extended to any intelligent farmer than a sufficient supply of water for irrigation. On the other hand, no more dangerous element could be placed in an ignorant and careless man's hands than an unlimited supply of water. It is, unfortunately, human nature to use indiscreetly that which costs nothing. The fact cannot be too strongly impressed upon colonists on the Company's irrigated lands, that it is absolutely suicidal to use more water than is essential for maximum results. If in doubt, always use the smaller quantity of water and be on the safe side.

CANVAS DAMS.

Farm ditches are built with a certain grade, depending upon the quantity of water to be carried and upon the nature of the soil. They are generally

so constructed that water will run at a velocity of one foot per second. When an obstruction is placed in such a ditch it is evident that the water will overflow and escape on to the land, and this is the principle adopted in irrigation. A small dam made of earth or a "canvas dam," is placed in the ditch, and the water consequently overflows upon the land.

Canvas dams are made by taking a piece of stout canvas 4 to 6 feet square (depending upon the size of the ditch) and securely nailing one of its edges to a 1 in. x 4 in., or 2 in. x 4 in., about six feet long.

HOW TO IRRIGATE.

In irrigating a field always begin at the end of the ditch nearest the head-gate, and irrigate toward the further end of the small distributary. If earth dams are used, put in the first dam before the water is turned in, then as the water is overflowing to irrigate the first portion of the field, the operator should put in his next earth dam further down the ditch. This avoids the difficulty of attempting to build dams in the running water. The canvas dam is very much better than the earth. In turning the water into the ditch the operator should first lay the canvas dam across the ditch, at the point where he desires the overflow of the water, with the free edge of the canvas "up-ditch," or toward the delivery point.

As the water is turned in the operator should stand upon the free edge of the canvas dam in the bottom of the ditch. The water in rushing down will be stopped by the canvas, and will overflow the banks of the ditch. A shovelful of earth thrown upon the canvas will stop any leakage almost completely. In changing the canvas dam to another point, the operator simply lifts it out of the ditch, and walks **down** the ditch, holding the stick of the canvas dam in both hands in front of him. When he gets to the point where he desires the next irrigation, he simply lowers the canvas in front of him, and by putting his foot upon the canvas until the water reaches him, may then simply lower the stick of the canvas dam across the top of the ditch and the water is stopped as before.

METHOD OF IRRIGATING ALFALFA AND GRASS MEADOWS.

Permanent crops are most commonly irrigated by being flooded from field laterals. Immediately after sowing the crop the various laterals are laid out in such a way that they will impede as little as possible the progress of the mowing machine at the time of harvest. The material taken out of the laterals should be, as far as possible, spread over the surface, and the laterals should be constructed wide and with an easy slope to both sides. It will pay farmers to exercise special care in providing the most perfect system of distribution in cases of that sort, as it need not be disturbed for several years, and will materially facilitate not alone the application of water, but also the operation of farm implements.

It would be well to have the soil in fairly moist condition before the seed is applied, and the application of water should be avoided during the very early stages of the growth. Early irrigation causes the roots to branch out near the surface and to depend for food and moisture upon the top

layers of soil, which are subject to extremes of drouth and moisture. If the soil is fairly moist at the time of seeding and the surface in good condition to retain the moisture, there will be no need of applying water until the crop shades the ground. Even though the crop should suffer slightly from lack of moisture, it will, as far as alfalfa is concerned, be better to withhold water, so as to force the plant to extend its top root as far as possible into the subsoil in an effort to hunt for moisture from beneath.

In irrigating fodder crops, it is well to keep the field laterals from 20 to 25 rods apart on a grade of three to four inches for each 100 feet. This, of course, will vary somewhat with the general slope and contour of the land. One irrigator can frequently attend to two streams which are kept running in adjacent laterals. The water is allowed to run until the upper foot of the soil is saturated, and any excess that runs off will be caught by the lower lateral.

The proper amount of irrigation may readily be determined by inserting the shovel to its full depth into the soil, and if no dry earth is turned up, the irrigation is sufficient. By this method one man can, without effort, irrigate up to five acres in a day.

Considerable economy in time has followed the use of laterals constructed somewhat on the funnel principle, which overflow automatically on letting in the water. These laterals should be about two feet in width at the head, gradually tapering to a point at the end, and should be located from 20 to 30 rods apart. When a sufficient head of water is forced into such a lateral it will irrigate a large area with little or no attention. In fact, where the land is fairly level one man can readily attend satisfactorily to from two to three hundred acres of alfalfa or other meadow irrigation.

These tapering laterals may be very cheaply made by using an adjustable double mould-board plough, specially made for the purpose.

Great care should be exercised in constructing such ditches with a very uniform slope to avoid the water forcing its way through some low place in the ditch bank, and escaping over one particular area.

IRRIGATION OF CEREAL CROPS.

Grain fields are generally irrigated by field flooding from laterals. It will invariably pay to irrigate grain crops where the area has been seeded down to any of the perennial forage crops, and in very dry years there can be no question that the irrigation of grain crops of any sort will be a paying practice. The irrigation of oats will generally be followed by good results, and the same holds good in regard to barley. For the production of a green crop for feeding, there can be no question but that irrigation will be profitable almost irrespective of how wet the season may prove to be.

As soon after seeding as possible field laterals are run out uniform in width throughout their entire length. These extend from the head gates of the main ditch and are placed from sixty to seventy feet apart. If the surface has been well prepared, a grade of $1\frac{1}{2}$ inches to the rod will be ample for the laterals. No fixed rule can be laid down for the proper time to irrigate grain. The soil should contain sufficient moisture at seed time



Swedish Select Oats which Produced 110 Bushels per Acre. Grown on C. P. R. Demonstration Farm, and Irrigated Once

to nourish the crop until it shades the ground. A quantity of water, varying from five to eight inches in depth, may be applied at one irrigation at that time. As a general thing one irrigation will be found to be sufficient, but if a second irrigation is required it is usually applied when the grain is beginning to head out.

The plants are using at this time the maximum amount of moisture, and as soon as there is a deficiency they begin to suffer. When the growth is checked at this stage, lost vigor cannot be restored by the subsequent watering, and the yield is lessened. No water should be applied during the last three weeks of growth. However, it will be very rare that two irrigations of grain crops will be necessary in the Bow Valley district.

Great care must be exercised in irrigating grain. Unless the crop has been somewhat thickly seeded the application of too much moisture is liable to induce too great stooling and individual development of the straw and heads, thus delaying the ripening process to the danger limit. As has already been said when the season is reasonably wet, only one irrigation will be necessary, and this should be applied about the time the grain is heading out. If, however, at that time the straw is long and heads well formed, and the plant does not appear to be suffering in the least from lack of moisture, it might be better practice to omit irrigation entirely. The above remarks, of course, only hold good in respect to grain crops that are required to mature. It will scarcely be possible to apply too much water within reasonable limits to green crops, particularly if the weather is inclined to be hot.

IRRIGATION OF FIELD PEAS.

This crop may be planted either for grain or for forage. If grown for forage, field peas are generally sown as directed on page 23, and after seeding a bushel of oats per acre is broadcasted and harrowed in. The oats tend to facilitate harvesting and also induce longer growth of vine.

It is generally best to irrigate, when grown for green feed, when the peas are in blossom, and again when they are past the boiling stage. The ground should scarcely be allowed to dry to any extent. Some years it will take four or five irrigations, while other years three may be found to be sufficient.

Certain investigations have been carried on at high altitudes in Wyoming, under the auspices of the State Experimental Station, regarding the irrigation of field peas. Of six fields, other conditions being the same, the highest yield for field peas for forage was 4.2 tons per acre, obtained with the use of water to a depth of nearly 23 inches applied in seven irrigations. The highest yield of peas, namely 34.75 bushels per acre, was obtained when about 20 inches of water in depth had been applied in four irrigations. The yield was decreased when either more or less water was used. It is concluded that a depth of a little under 20 inches of water will give best results for field peas.

In the Bow Valley district, for a grain crop, one irrigation, and at most two, will likely be found to be sufficient. The crop should be cut when green enough to cut and hold the peas. It should be noted that each irrigation

delays the maturity of peas. The intelligent farmer will, of course, to some extent consult the texture of his sub-soil and the natural rainfall and increase or decrease the water accordingly.

Field peas are an exceedingly profitable crop under irrigation. A net profit of \$50 per acre is easily possible under the best methods of irrigation, in raising seed for market, when the market price amounts to about 3c. per pound. Pea vine forage is very highly esteemed, and should readily sell at \$10 per ton, which would realize a net profit of between \$25 and \$30 per acre for green crops.

Southern Alberta is just initiating a splendid industry in the production of Field Pea seed under irrigation. This is, at present, the only portion of the continent where peas can be grown without the destructive influence of the pea weevil. Alberta has the opportunity of supplying seed to the rest of America.

IRRIGATION OF ROOT CROPS.

It goes without saying that there should be enough moisture, either natural or artificial, in the soil to sprout the root seeds. Also a cardinal principle in root growing under irrigation is to follow, as soon as the soil will permit, with surface cultivation. This cannot be too strongly impressed upon those who are not experienced irrigators. It is the best practice in irrigation farming to use water sparingly, and to introduce every effort in cultivation to preserve the moisture supplied. We must remember that irrigation will not take the place of cultivation. One irrigation, and three cultivations are infinitely superior to three irrigations and one cultivation.

Root crops are irrigated by furrows made midway between the rows. These furrows should not be more than 500 feet long and in light, sandy soil with little fall this distance should be reduced. Short furrows insure a more even distribution of water, and frequently prevent injury to the crop by water-logging the soil near the lateral.

IRRIGATION OF POTATOES.

In Colorado the common practice in raising potatoes is to grow alfalfa for two years, and then to plant the ground to potatoes for two years, and at the beginning of the fifth year sow to wheat. In turning down alfalfa in the spring before planting the potatoes, the field should be irrigated and afterwards plowed from 6 to 8 inches deep when the soil is dry enough to crumble up into small particles as it falls from the plow mould-board.

Some farmers prefer to take off a grain crop after alfalfa so as to thoroughly eradicate the latter from the soil before planting to potatoes, as in cases where the alfalfa is not completely killed out it proves very troublesome amongst the potatoes, and a great deal of hand labor is required to keep the potatoes clean. Alfalfa will probably prove difficult to kill out in Southern Alberta, and a grain crop before potatoes is, therefore, recommended.

Potatoes require the most careful treatment. The ground intended for an irrigated crop should be smooth, having sufficient slope to make the water run freely between the rows (7 to 10 feet to the mile gives good results). It should be dragged until the soil is firm throughout and thoroughly pulverized in the surface. The ground should be laid off in rows $3\frac{1}{2}$ feet apart with a marker. If the early Ohio, which grows the smallest vine of any variety, be used, it is advisable to plant the potatoes 10 inches apart in the row. Varieties producing larger vines should be placed at a greater distance. The closer you have the rows together and yet being able to cultivate with a single horse, the better probably will be the result, as it is essential that the ground should be protected to the greatest possible



Irrigated Potatoes which Produced 350 Bushels per Acre, 1910.

extent by the vines in order that the moisture may not evaporate too quickly after irrigation on hot days. The potato is a plant that does best in a cool, moist soil. The practice is quite prevalent of giving the ground a good soaking prior to putting in the seed.

When the sprouts appear above the ground they should be promptly harrowed so as to preserve the moisture and kill the weeds. It is a very difficult matter to lay down any direction that would be applicable in all cases in regard to the proper handling of water upon a potato crop. It

may, however, be stated that it is generally vastly better to allow the potato vines to attain a considerable growth before water is applied. If the ground should turn very hot and dry and the vines should show signs of ceasing to grow, water becomes a necessity irrespective of the season, unless the crop is very near maturity.

If the spring has been cold and backward and the sub-soil is still lacking in warmth, it will be found fatal to the potato plant to apply water, even if the soil is abnormally dry. In the average season in Southern Alberta, one irrigation should mature a crop of potatoes, but if the growth of vines is heavy and shades the ground well, two or even three waterings will increase the yield. However, three irrigations will likely reduce the value of the potatoes for table use.

As previously stated, each application of water should be followed as soon as possible with a thorough cultivation until the vines are too large or the tubers too near the ground to permit of it. As a rule, it is best not to have rows over 40 rods in length. If the ground is very steep, of course, the water will run through quickly, but it will have to run longer than in a row with less fall, to give it time to soak in.

After once irrigating a crop of potatoes, it is very important that the ground should never be allowed to become too dry, thus stopping the growth of the potato. If this is permitted, and by irrigation the potato again starts to grow, it will either increase irregularly in size or set a second crop, thus giving a large number of small or ill-shaped potatoes. Irrigation should generally be discontinued about the latter part of August, although if the autumn is extremely dry, a light irrigation later on may be made.

The most experienced potato growers in America reside in the Greeley colony, in Colorado. The practice there is, never to irrigate potatoes until after the young tubers are set. The reason for this is obvious. When irrigated immediately before setting, a greater number of potatoes will be formed than the plant can support, and consequently only a few of them grow large enough to be marketable. When tubers are allowed to form first and are irrigated afterwards, fewer potatoes will form on each hill, but a larger crop of marketable tubers is the result.

It should be borne in mind that water should be most carefully handled on potatoes and should never reach the crown or stem of the plants. It is the roots and not the tubers that are to be watered, and the roots will extend some considerable distance towards the middle of the row while the tubers are yet small. A good plan is to scuffle the potatoes just prior to irrigating with a scuffer that will in a measure throw the earth up against the vines on each side, and thus leave a small furrow down the centre of the row for the water. It has been found that where manure is applied to potatoes, a greater quantity of water can with safety be used; in fact, is necessary, otherwise the manure will have a tendency to burn the tubers and produce fungus growth. In irrigating potatoes, a great deal depends upon the lay of the land and the facilities with which it can be drained. With a porous sub-soil and a good slope a much larger quantity of water can be used than would otherwise be the case, but until the beginner has

gained some experience in handling water, it is a safer proposition to use it sparingly, even with a crop like potatoes that can stand more moisture than other root crops.

In the Bow Valley one good irrigation, after the tubers are set, followed by frequent cultivation, will perhaps produce the finest table potatoes. This of course, assumes that there is sufficient moisture in the soil prior to planting to give a normal germination.

IRRIGATION OF SUGAR BEETS.

The irrigation of sugar beets is performed in a manner similar to potato irrigation. The greatest of care must be exercised in irrigating this crop, and in order to avoid mistakes, all colonists on the Irrigation Block that decide to grow sugar beets, should keep in close touch with the Company's Demonstration Farms and obtain the advice of the staff maintained there, whose duty it is to give information on the subject.

The seed bed should be thoroughly pulverized before planting. As soon as the ground is warm, the seed should be planted two inches deep and drilled 16 to 24 inches apart. On comparatively new land in the Irrigation Block, it will probably be advisable to provide ample space between rows.

If it should be found necessary in a very dry spring to irrigate in order to germinate the seed, flooding should not under any circumstances be resorted to. Rills should be made between rows and the water allowed to run slowly through them in order to percolate to the seed bed. Up-to-date beet drills have irrigating attachments, and these rills may be made at the time of seeding. It is a well known axiom that the more cultivation that is devoted to beets the greater will be the sugar content of the root.

As soon as the beets are all up, and not later than the stage when the beets have thrown out from 4 to 6 leaves, they should be thinned to single plants 4 to 6 inches apart in a row. In very rich and well cultivated soil six inches may be sufficient, but on the new lands of Southern Alberta it will be found advisable to increase the distance somewhat, at least for a couple of years after the land is broken and until it becomes mellow. While the water content of sugar beets is very considerable, the ability of such a deep rooting plant to obtain moisture from the lower strata of the soil is naturally very considerable, and for that reason less water is required than would suffice for more shallow rooting plants. There cannot be any reasonable doubt that a vast amount of harm may be done by over-irrigating sugar beets. During the fall particularly, the beet requires a very dry surface soil to increase its saccharine content, and will generally thrive upon the moisture it has received from the irrigating water during the summer season. Stop irrigation early, guard carefully against seepage from surrounding crops, and never apply sufficient water to flood the ground.

Sugar beets make an excellent crop for stock feeding, and where required for that purpose, the same care is not as essential as growing them for the sugar factory; in fact, 5 to 7 irrigations during a moderately warm season would give good results for feeding purposes only.

IRRIGATION OF FRUIT TREES.

Apple trees should be planted from 24 to 30 feet apart each way, depending upon variety; Plum trees about 20 feet apart. The common method of irrigating large fruit trees in Western America is by furrows from 500 to 600 feet in length. The surface should be cultivated after rain and after each irrigation, and, if necessary, during intervals. Young trees should be watered by a furrow on each side of the row. The idea to be kept in mind is to train the roots outwards and down so as to enlarge their feeding zone. The perfect way of watering fruit trees would be to keep the surface as dry as possible and apply the water from beneath. The more closely the irrigator



Strawberries Grow Abundantly in Irrigation Block.

approaches this system by the use of deep furrows, each carrying a small and continuous stream running from two to three days at a time, the more successful he will be.

Sometimes crops such as oats and potatoes are grown between the rows while the trees are young. This is done to help to use up the surface moisture and induce deep rooting of the trees.

IRRIGATION OF SMALL FRUITS.

These should be irrigated by a small furrow on each side of the row, and the soil kept well cultivated after each irrigation. The small branches may be cut back after the first year's growth, so as to harden the wood.

With strawberries and such plants, it is a good plan to ridge up the ground before setting out, and induce the vines, as far as possible, to grow on top of the ridge. Irrigation may then be carried on in the hollow between the ridges and thus the vines and berries are kept from the water.

IRRIGATION LITERATURE.

As many of those who own irrigated lands in the Block are strangers to artificial watering it will pay them to obtain one or more text books on the subject written by practical men. Among the best books might be mentioned:

Irrigation and Drainage, by Prof. King (MacMillan Co.) Price \$1.50.

Irrigation Farming, by Lucius M. Wilcox (The Orange Judd Company).
Price \$1.50.

Primer of Irrigation, by D. H. Anderson (The D. H. Anderson Co., Chicago). Price \$1.00.

Water users in the Irrigation Block are also advised to write the Dominion Commissioner of Irrigation at Calgary, Alberta, for copies of the bulletin issued to the Department of the Interior and entitled "Irrigation in Saskatchewan and Alberta."

In addition to the above, a great many helpful and practical bulletins have been issued by the United States Department of Agriculture and also by many of the States Experiment Stations. While these publications are intended for the use of residents in the United States, requests from Canadian farmers have always been given the most courteous consideration. In fact, the State Experiment Stations, invariably send their bulletins to all applicants from Canada entirely free of charge. The United States Department of Agriculture sell these bulletins at cost price, which only amounts to a few cents for each publication. The following is a partial list of those that would be of special interest to residents of the Irrigation Block:

Colorado Experiment Station, Fort Collins, Colorado:

Bulletin No. 13—On the Measurements and Division of Water.

Bulletin No. 22—Preliminary Report on the Duty of Water.

Bulletin No. 83—Irrigation Waters and their effects.

Utah Agricultural and Experiment Station, Logan, Utah:

Bulletin No. 99—Irrigation and Drainage Investigations.

Bulletin No. 105—Factors Influencing Evaporation and Transpiration.

Bulletin No. 111—The Reclamation of Seeped and Alkali Lands.

United States Department of Agriculture, Washington, D.C.:

Bulletin No. 138—Irrigation in Field and Garden.

Bulletin No. 158—How to Build Small Irrigation Ditches.

Bulletin No. 263—Practical Information for Beginners in Irrigation.

Bulletin No. 371—Drainage of Irrigated Lands.
Bulletin No. 373—Irrigation of Alfalfa.
Bulletin No. 392—Irrigation of Sugar Beets.
Bulletin No. 399—Irrigation of Grain.
Bulletin No. 404—Irrigation of Orchards.
Bulletin No. 172—Irrigation in Montana.
Bulletin No. 177—Evaporation Losses in Irrigation and Water Requirements of Crops.
Bulletin No. 393—The Relation of Irrigation to Dry Farming.
Bulletin No. 514—Methods of Applying Water to Crops.



PART VII.

LIVE STOCK HUSBANDRY.

Those who are unaequainted with irrigation development are very apt to misunderstand completely the principal object the Canadian Pacific Railway Company had in view when embarking upon the gigantic irrigation enterprise east of Calgary. As the majority of the settlers who have purchased lands in the Irrigation Block come from places where irrigation is not practised, it is very important that the subject should be plaed intelligently before them, so that they may have a proper understanding of all that irrigation development implies in order that they may, if they see fit so to do, adjust their agricultural operations to what it is firmly believed is the most profitable and lasting system of husbandry that can be followed on irrigated land in Southern Alberta and, for that matter, anywhere else, irrespetive of climatic and other conditions.

IRRIGATION AND FODDER PRODUCTION.

In studying the economic side of irrigation, the first fact that must be clearly grasped is, that the foundation of any irrigation enterprise is not the production of either fruits, cereals, garden truck, or other expensive crops, but the feeding and finishing of live stock and the development of dairying in all its branches. This has been the history of irrigation expansion in every state of the union.

It is thus abundantly clear, that animal husbandry in all its branches vastly overshadows any other line of agricultural production on the irrigated farm. The evidence in support of this fact is even more conclusive when it is taken into consideration, that the bulk of the cereal crops harvested on the irrigated farms are fed to live stock there. This will increase the percentage of the irrigated area of the United States devoted to the production of feed for live stock to at least eighty per cent. of the total.

LIVE STOCK PRODUCTION.

To the man who is interested in stock, its breeding, feeding and raising, there are many questions which confront him, the greatest of which is, doubtless, that of fodder and grain. With the possession of stock, naturally comes the question of feed, and with its economic solution comes profit and wealth. Given stock and its food, man may sit down and count upon his increases with no perplexing thoughts of the future. Such conditions are found in the Canadian Pacific Irrigation Block, which is destined to serve the same purpose in regard to the highest development of the live stock industry, as do the Corn growing states, tributary to the great market

centres of the Union, and the irrigated valleys of the Western States. The time is close at hand when most of the live stock produced in Alberta and now marketed in a more or less unfinished condition, will be sent to the rich alfalfa growing lands east of Calgary, there to be put into prime shape before being exported or slaughtered. A home market at highly remunerative prices will thus be made available for all the fodder that can be produced on our irrigated lands, and with the additional advantage of having the feed consumed on the irrigated farm and ultimately returned to the soil that grew it, thus maintaining forever the fertility for which these lands have already gained renown.

HORSES.

Alberta is noted for her fine horses of almost all breeds. The western climate is very beneficial in the way of producing excellent feet on the horses.

Many intending settlers write us asking if we would advise their shipping in ordinary farm horses to Alberta. This will, of course, depend altogether on the kind of horse. Good ordinary farm horses of from 1300 to 1500 lbs., thoroughly broken and sound in wind and limb, may be purchased in Alberta at from \$175 to \$300 each. If one can wait for opportunities, it is then quite possible to make good selections at fairly reasonable prices.

Of the heavier breeds of horses, perhaps the Clydesdale, Shire, Belgian and Percheron, are in the lead. Where one can do so, money judiciously invested in registered mares of any of the breeds mentioned above will bring good results in high priced colts. Horses are rather scarce, and high prices are likely to reign for some years.

DAIRY CATTLE.

With alfalfa and good dairy cows no Province or State on the continent will be able to excel Alberta as a dairy province.

As fine herds of Holsteins, Ayrshires and Jerseys may be found in Alberta as in any other section. Other herds of Guernseys, Red Polled and Milking Shorthorns, while not so numerous, are yet coming to be found in larger numbers each year.

Prices for milk range from 18c. to 25c. per gallon, while the price of cream ranges from 75c. to \$1.50 per gallon for a 25 per cent. article. Creamery butter brings from 25c. to 50c. per pound, depending upon the season of the year, while dairy butter rarely goes below 25c per lb.

There are such enormous developments going on in the Province that there is a wonderful market for all these products, especially milk and cream.

The dairyman will find Alberta a place where he can make a splendid revenue in the dairy business from the day he lands.

BEEF CATTLE.

The free western range for beef cattle is practically gone, but a brighter future is ahead for the beef men, as the successful growing of alfalfa in the



Money Makers in the Irrigation Block.

irrigated districts of Alberta will make these districts the great feeding ground for thousands of steers every year. As the Yellowstone Valley of Montana with its alfalfa is coming to be the great finishing ground for Montana grown cattle, so will the Bow Valley be the finishing ground for Alberta's fat cattle.

Where there used to be the few herds of cattle consisting of thousands of cattle in each, the future will see instead the thousands of individual farmers each feeding from one to a car load. Thus will Alberta still continue to produce her fine quota of cattle, and, not only that, but they will be better finished. The Shorthorn, Hereford, Aberdeen Angus and Galloway are perhaps the principal beef breeds represented in Alberta.

SHEEP.

The large bands of sheep are practically gone from the great western plains, and yet with the incoming thousands of settlers, sheep breeders are finding a very large demand for small bands of sheep. The same thing is true with sheep as with the cattle for with the disappearance of the few large flocks, we find taking their place the thousands of small farmers' flocks. A great deal of Alberta's sheep product, during the coming five or ten years, will be consumed in the establishments of the small band of 25 to 50 on each 160 acres of land. And when this demand is satisfied, the aggregate of sheep produced in Alberta will be just as great as in the palmiest days. The flocks of the west have had a large foundation in the Merino and Rambouillet, largely on account of the wool. However, in the present day, mutton is being considered almost equally with wool, and for this reason the heavier mutton breeds are regarded with favor. The Down breeds are therefore considered as well adapted to present day Alberta conditions.

HOGS.

Here again the transportation companies tell us that the shipments of hogs are decreasing, but a far better thing is taking place, and that is, that all surplus stock is being picked up by the incoming settlers.

Hog raising is one of the most profitable branches on the mixed farm. For those who think that hogs cannot be raised cheaply without corn, we wish to state that in hulless barley, Alberta has a substitute that is just as good as corn. Pork produced by barley is mild in flavor, and excellent in quality.

Dairying and hog raising go hand in hand, and are very profitable.

For summer there is no cheaper pasture for hogs than alfalfa or rape.

The chief hog grown in Alberta today is perhaps the large Yorkshire White, principally on account of its bacon qualities. The Tamworth, Berkshire, Duroc Jersey and Poland China are also found in considerable numbers.

POULTRY.

It will surprise the incoming settler how much very excellent poultry may be found in Alberta.

Of the common breeds, perhaps the Barred Rock, White Rock, White Wyandotte, Buff Orpington, Rhode Island Red, Rosecomb, Brown and White Leghorns, may be regarded as among the most popular.

Other breeds of course might be named that will give excellent results.

Eggs rarely get below 20c. per dozen, and in the winter and early spring range from 40c. to 60c. per dozen. For the common breeds settings of 13 eggs usually sell for \$1.50, although much higher prices are frequently paid for eggs from good strains.

It will surprise one the amount of profit that may be made from poultry when intelligently handled.

BEEs.

The honey bee is coming into Alberta gradually, and very excellent honey is produced from the myriads of wild flowers growing upon the prairie. Besides this there is the alfalfa, sweet and red clover crops that make a splendid foraging ground for these honey gatherers. For those who wish to produce alfalfa seed, the bee will be found very beneficial in working over the alfalfa field.

Practically all the honey is imported into Alberta, so that there is a very excellent market at very remunerative prices.



